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AQUATIC NUISANCE SPECIES (ANS) MANAGEMENT PLAN

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MONTANA

AQUATIC NUISANCE SPECIES (ANS)

MANAGEMENT PLAN

DRAFT

Produced by:
Montana Aquatic Nuisance Species (ANS) Technical Committee
A subgroup of
The Montana ANS Steering Committee

July 15, 2002

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This plan was prepared with support from Montana State Government Agencies and Universities, Federal land management agencies and numerous private parties, companies and interested parties.

The cover picture of the West Fork of the Bitterroot River was provided by Mark Lere, FWP.

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EXECUTIVE SUMMARY

Aquatic Nuisance Species (ANS) are a serious problem in Montana. There are currently over 70 nonindigenous aquatic species reported in the state and more are expected to arrive. Current state activities and authorities address some ANS, their prevention, and control. However, these activities are not coordinated nor comprehensively managing the impacts of ANS. The importance of Montana's aquatic resources requires a coherent response to the threat posed by ANS. This management plan is the initial step in establishing a program in Montana to specifically address ANS issues.

The federal Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, amended by the National Invasive Species Act of 1996, calls for the development of state and regional management plans to control aquatic nuisance species. With approval of a state plan by the national ANS Task Force, matching funds for activities detailed in the management plan are available. Using guidance from the ANS Task Force and state agencies, this plan was developed to comprehensively address specific aquatic nuisance species, provide a management framework, and set objectives and actions to prevent and reduce the impact of ANS in Montana. A working group composed of personnel from state and federal agencies and private organizations produced the Montana ANS Management Plan.

The goal of the Montana Aquatic Nuisance Species Management Plan is to minimize the harmful ecological, economic, and social impact of ANS through prevention and management of introduction, population growth, and dispersal into, within, and from Montana.

The Plan includes a system to classify all nonindigenous aquatic species in Montana, identifies the proper management for each class, details current authorities and programs, and sets objectives that will lead to the accomplishment of the Plan goal. These objectives include: the establishment of a management structure that coordinates ANS activities, a strong prevention program, a monitoring program that allows for the early detection and eradication of pioneering ANS, a control program aimed at established species, education, and research. Specific actions necessary for implementation of this plan should include: establishment of an invasive species council, support of regional efforts, provisions for dedicated funding for ANS management activities, an annual survey of high-risk waters, a citizen monitoring network, emergency response plans, public education, research on management options, and other activities as necessary.

Montana currently has many programs that contain ANS management components. Since these programs are imbedded in larger efforts, such as nursery inspections, fish import oversight, and monitoring for pathogens and ANS during routine fisheries surveys, it is difficult to establish the present level of effort on ANS management in the state. The cost of an effective, coordinated management program for ANS is substantial. Total estimated costs are nearly $3 million per year, which is less than the estimated economic impact of one invasive aquatic plant, according to an economic assessment of weeds in Montana recently completed by the Montana Department of Agriculture. Detailed information on the budget can be found in the implementation table. The Plan is structured for phased or incremental implementation, with high priority on establishment of an Invasive Species Council and a coordinator position.

INTRODUCTION

Aquatic Nuisance Species (ANS) are nonindigenous plant or animal species that threaten the diversity or abundance of native species, the ecological stability of infested waters, or commercial, agricultural, aquacultural, or recreational activities dependent on such waters. ANS are the cause of significant ecological and socio-economic problems throughout North America. Invasive species, such as zebra mussels, Eurasian watermilfoil, and whirling disease are being introduced into new habitats at an alarming rate. After introduction, populations often grow quickly and spread rapidly due to lack of natural controls. Once established, they often displace native species, clog waterways, impact municipal and industrial irrigation and power systems, degrade ecosystems, reduce or threaten recreational and commercial fishing opportunities, and can cause wildlife and public health problems.

A number of these ANS have become established in the United States and represent a threat to the nation's aquatic resources. As the introduction and spread of ANS continues, the associated problems intensify and create a wide variety of ecological and socio-economic problems for water users. In 1990, the Nonindigenous Aquatic Nuisance Prevention and Control Act (NANPCA) was passed by Congress to address ANS problems in the United States. This legislation provided an opportunity for federal cost-share support for implementation of state plans. While programs created by this national legislation were initially aimed at problems in the Great Lakes region, the reauthorization of NANPCA in 1996 as the National Invasive Species Act (NISA) established a national goal of preventing new ANS introductions and limiting the dispersal of existing ANS in all of the states. NISA specifies, among other things, that state plans identify feasible, cost-effective management practices and measures that can be implemented by the state to prevent and control ANS infestations in a manner that is environmentally sound. Approval of a state ANS management plan by the Federal Aquatic Nuisance Species Task Force is required for Montana to be eligible for federal cost-share support. Section 1204 of NISA regarding state ANS management plans, is included in **Appendix A**.

The following are points to consider and issues addressed in the Montana ANS Management Plan and should provide guidance in the future development and establishment of the ANS long-term management program.

1) There are many pathways of introduction and spread for ANS, most of which are related to human activities, both accidental and intentional. New species continue to be introduced and spread within North America through these pathways.

2) Introductions have many costs associated with them:

- Economic impacts
    a. costs to producers, retailers (loss of tourism dollars), guides, etc. in lost income
    b. costs to producers, guides, state (i.e. taxpayer) in control, prevention, and monitoring measures

- Ecological impacts
    a. displacement of cash crops, desired harvestable animals & plants
    b. loss of native/sensitive plant & animal species
    c. homogenization of the environment
    d. degradation of aquatic environments
    e. disruption of food webs and nutrient cycles – reducing productivity
    f. impacts of control measures to non-target organisms

3) Prevention is the best course of action. Management plans, education programs, and regulations are strategies that can help in the prevention and spread of ANS.

4) Often there are few, if any, acceptable controls available for use in natural water bodies once ANS become established.

5) Once species are successfully introduced, any control efforts will be very expensive and total eradication very unlikely.

The coordinated efforts contained within this plan are designed to protect residents of Montana and its aquatic resources from the multitude of potential losses associated with ANS plants and animals. This management plan focuses on preventing the accidental introductions of new ANS, limiting the spread of existing ANS, and controlling or eradicating ANS where environmentally and economically feasible. It also complements the current Montana Weed Management Plan. The intentional introduction of nonindigenous species for aquaculture, commercial, or recreational purposes is addressed to ensure that these beneficial introductions do not result in accidental ANS introductions, and to improve information sharing among those agencies responsible for regulating intentional introductions.

Montana has the opportunity to prevent or prepare for the introduction of one of the most destructive ANS, the zebra mussel (*Dreissena polymorpha*). Montana waters are well suited for the survival of zebra mussels. States where zebra mussels are present have reported severe environmental and economic damage resulting from their accidental introduction. Currently zebra mussels are not established in Montana or other waters west of the 100th Meridian but live zebra mussels have been found on boats being trailered across the US to several locations in California. Montana must act quickly with our neighboring states and Canada to avoid or reduce major impacts associated with these ANS. A recent study shows invasive species, including aquatics, are imposing an enormous economic burden, estimated at $137 billion/year, on the United States (Pimentel et al. 2000).

Nonindigenous aquatic nuisance plants, such as Eurasian watermilfoil, hydrilla, purple loosestrife, and water hyacinth quickly establish themselves, displacing native plants. Environmental and economic problems caused by the dense growth of these weeds include impairment of water-based recreation, navigation and flood control, degradation of water quality and fish and wildlife habitat, accelerated filling of lakes and reservoirs, and depressed property values.

Whirling disease has been in the United States since 1956 and was first discovered in Montana's Madison River in December 1994 where population numbers of wild rainbow trout declined about 80% (Vincent 1996). In Montana, most of the damage to wild trout populations has been to rainbow trout, although there is the potential for population damage to wild cutthroat and brook trout (Vincent, 2001). Currently, whirling disease is found in over 95 different streams with only a few major river drainages uninfected.

These ANS and the growing list of nonindigenous species in Montana (**Appendix B**) are classic examples of why this state ANS Management Plan has been developed. This plan is intended to help the state coordinate efforts and secure long term cooperative funding to prevent, eradicate or control new introductions more effectively, before they cause major environmental and economic damage within Montana. The Montana Aquatic Nuisance Species Technical Committee developed this plan with interagency and public support. The technical committee consists of state, federal, tribal, and private party members. This plan, including its goals and objectives, will be reviewed and revised annually, if necessary. Interested or impacted parties are welcome to participate in plan revisions. Public hearings and comments will provide guidance and support of the plans goals, objectives and implementation.

PROCESS AND PARTICIPATION

Assessing ANS in Montana requires participation by many agencies and interest groups. This plan was written by the ANS Technical Committee and reviewed and endorsed by some of the ANS Steering Committee, which has representatives from nearly every organization and agency in the state that may influence the spread of ANS. Numerous Technical Advisors provided species-specific information and technical review of the document (**Appendix C**). It is critical to have the dedicated and coordinated efforts from all of these individuals and their corresponding entities to successfully combat the inhabitation and spread of ANS in Montana. Many people and organizations have yet to realize the threats caused by ANS to our environment and lifestyle.

While various ANS prevention and education techniques have been ongoing in many organizations for years the formation of an interdisciplinary, interagency committee to help coordinate these efforts and develop a formal management plan began in earnest in late February 2001. On Feb. 28, 2001 Montana representatives met with representatives from Oregon who were instrumental in developing the Oregon ANS Management Plan. This meeting was attended by most of the representatives instrumental in writing the draft Montana ANS Management Plan. A draft schedule and committee membership list was developed as well as proposed plan outline. Since that meeting the ANS technical committee has met almost monthly to draft and develop the plan.

The Montana Aquatic Nuisance Species Management Plan will be available for public comment for a 60-day period, which will end on September 15th, 2002. A press release will be issued to all local and regional news sources, followed by an email to all steering committee members that requests them to post information relating to the public comment period. The public comments received will be included in **Appendix D**. The response to the comments will be incorporated within each individual public comment. Public comments should be sent to the following address by the **September 15, 2002 deadline**:

Montana ANS Management Plan
Montana Fish, Wildlife and Parks
Fisheries Division
P.O. Box 200701
Helena, MT 59620-0701

The Final Plan will be submitted to the Governor for approval. Following the Governor's approval, the Governor would submit the Plan to the Federal ANS Task Force. Approval by the Federal ANS Task Force would allow the state to receive federal funding for ANS activities in Montana as detailed by the National Invasive Species Act (NISA) of 1996 and as identified in the Implementation Tables. If approved by the Federal ANS Task Force funding would become available in March 2003. The federal funding would require a 25% non-federal match.

AUTHORITIES AND PROGRAMS

STATE

In Montana, many state agencies have authority over and regulatory roles in managing natural resources. While many agencies have some authority to regulate ANS, no centralized authority or management structure exists to coordinate ANS activities in Montana. This section describes the existing authorities related to ANS that various state agencies have for managing ANS.

Department of Agriculture

Agricultural Sciences Division of Montana Department of Agriculture (MDA) provides services and assistance in areas of pest management, including aquatic weed management, biological weed control, general weed management, rodent and insect management, and pesticide applicator licensing and training.

The *Montana Pesticides Act* [80-8-101 through 80-8-405 MCA] provides authority to the Montana Department of Agriculture to regulate all pesticides and pesticide applicators, including aquatic pesticides. It also provides for training and education of pesticide applicators. The administrative rules of the Montana Pesticide Act require special training and management plan development for the use of aquatic herbicides [4.10.30 through 4.10.318 ARM].

The *Montana Disease, Pest, and Weed Control Act - Control of Diseases and Insects in Nurseries* [80-7-101 through 80-7-135 MCA] prohibits persons from selling or distributing plant pests, including aquarium plants. Plant pests are defined as an insect, fungus, virus, bacteria, or other organism that can directly or indirectly injure or cause damage in a plant or a product of a plant, including noxious weeds or other exotic weeds. Criteria as an established pest is determined by Department rule.

The *Montana Quarantine and Pest Management Act* [80-7-401 through 80-7-404 MCA] allows for the adoption of intra- and interstate quarantines to prevent the introduction and spread of plant pests.

The *Montana Weed Control Act* [80-7-701 through 80-7-720 MCA] provides for a Governor's proclamation of an embargo against the introduction of noxious weed seed and plant materials from other states. It authorizes the Department to provide technical assistance and services on the management and control of noxious weeds.

Montana County Weed Control Act [7-22-2101 through 7-22-2153 MCA] allows for the enforcement of noxious weed management programs at the county level. All counties are required to have a written management plan for the control of noxious weeds in the county. All counties have a commissioner appointed weed board and many counties hire full- or part-time staff to carry out the functions of the county weed program.

The *Montana Weed Management Plan* was adopted statewide in January, 2001 and provides guidance on the development of weed management plans and programs across the state.

Department of Environmental Quality

75-5-308 Environmental Protection - Water Quality - Classification and Standards: short-term exemptions for the following activities: (b) application of a pesticide that is registered by the United States environmental protection agency pursuant to 7 U.S.C. 136(a) when it is used to control **nuisance aquatic organisms** or to eliminate undesirable and nonnative aquatic species.

Department of Fish, Wildlife & Parks

Montana Fish, Wildlife and Parks regulates the importation, introduction and transplantation of fish and other aquatic animals.

Montana Fish Health and Import Statutes (87-3-209 through 87-3-227 MCA) require an import permit issued by Montana Fish, Wildlife and Parks for importation of salmonid and non-salmonid fish into Montana. This statute specifies requirement for health certification and provides for inspection, quarantine and disinfection of fish culture facilities found to be contaminated with a fish pathogen. Administrative rules (12.7.501 through 12.7.507 ARM) further define this statute and provide for specific requirements for fish health testing, including specific pathogens and testing criteria. The ARM rules also further define the import permit requirements and quarantine and disinfection protocols.

Importation, Introduction and Transplantation of Wildlife Statutes (87-5-701 through 87-5-721 MCA) provides for broad authority to regulate importation, introduction and transplantation of wildlife species, including fish and other aquatic animals. This statute specifies that the importation for introduction or the transplantation or introduction of any wildlife species is prohibited unless a scientific investigation determines no threat of harm to native wildlife or plants or agricultural production will result from the action. This statute further states that a plan must be developed to ensure transplanted or introduced wildlife can be controlled if any unforeseen harm should occur from the introduction.

Leech Rules (12.7.540 through 12.7.542 ARM) outline requirements for importation of bait leeches into Montana. These rules give Montana Fish, Wildlife and Parks authority to regulate importation of bait leeches and require the Department to maintain a list of approved leech dealers. The rule outlines specific requirements for importation of leeches to ensure Zebra Mussel and other aquatic nuisance species are not imported into Montana with the leeches.

Many of these and other related FWP department statutes, rules and policies are listed in **Appendix E**.

Department of Natural Resources and Conservation

Jurisdiction over submersible and submerged lands generally. The title to the submersible and submerged lands of all navigable streams and lakes in this state now existing or which may have been in existence in 1889 when the state was admitted to the Union, or at any time since admission, and which has not become vested in any person, is vested in the State of Montana. The State of Montana is the owner of the submersible and submerged lands of such streams, and may use and dispose of the same as provided by law.

Montana Highway Patrol

The Montana Highway Patrol is reviewing other state statutes that address ANS transport, inspection and regulation of vehicles moving ANS on state or federal highways. The state of Washington recently passed legislation that allows their highway patrol to stop, inspect and impound, if necessary, any motor vehicle or trailer carrying ANS into or through the state. Similar statutes might be necessary in Montana to protect our waterways from accidental introduction of ANS.

Montana Department of Transportation

The Department of Transportation (DOT) is working with FWP in identifying appropriate locations for Traveler Information Stations (TIS) to be located along Montana borders to alert travelers to the dangers posed by ANS.

FEDERAL

No single federal agency has clear authority over all aspects of ANS management, but many agencies have programs and responsibilities that address aspects of the problem, such as importation, interstate transport, exclusion, control, and eradication. Federal activities on ANS management are coordinated through the National Aquatic Nuisance Species Task Force. In February 1999, President Clinton signed Executive Order (EO) 13112, which requires all federal agencies to collaborate in developing a national invasive species management plan that will include terrestrial and aquatic species. A brief description of the President's Executive Order, the Nonindigenous Aquatic Nuisance Prevention and Control Act (NANPCA), and the National Invasive Species Act (NISA) is provided below. Detailed information on NISA is provided in **Appendix A** and details of EO 13112, in **Appendix F**. A variety of other federal laws address aquatic nuisance species and are relevant to Montana. These laws are described in the table provided in **Appendix G**.

Executive Order 13112 on Invasive Species

President Clinton signed Executive Order 13112 on Invasive Species (64 Fed. Reg. 6183, Feb. 8, 1999), on February 3, 1999. The Executive Order seeks to prevent the introduction of invasive species, provide for their control, and minimize their impacts through better

coordination of federal agency efforts under a National Invasive Species Management Plan to be developed by an interagency Invasive Species Council. The Order directs all federal agencies to address invasive species concerns as well as refrain from actions likely to increase invasive species problems. A draft version of the National Management Plan was produced on October 2, 2000.

Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA; Title I of P. No.101-646, 16 U.S.C. 4701 et seq.)

This Act established a federal program to prevent the introduction of, and to control the spread of, introduced aquatic nuisance species and the brown tree snake. The U.S. Fish and Wildlife Service, the U.S. Coast Guard, the Environmental Protection Agency, the Army Corps of Engineers, and the National Oceanic and Atmospheric Administration share responsibilities for the implementing this effort. They act cooperatively as members of an Aquatic Nuisance Species Task Force to develop a program for protection, monitoring, control, and research. The Task Force conducts studies and reports to Congress:

- to assess whether aquatic nuisance species threaten the ecological characteristics and economic uses of U.S. waters other than the Great Lakes;

- to identify and evaluate approaches for reducing the risk of adverse consequences associated with intentional introduction of aquatic organisms.

Under NANPCA, state governors are authorized to submit comprehensive management plans to the Task Force for approval which identify areas or activities for which technical and financial assistance is needed. Grants are authorized to states for implementing approved management plans, with a maximum federal share of 75% of the cost of each comprehensive management plan.

National Invasive Species Act (NISA; P. No.104-332)

In 1996, NISA amended NANPCA to mandate regulations to prevent the introduction and spread of aquatic nuisance species into the Great Lakes through ballast water and other vessel operations. This Act required a U.S. Coast Guard study and report to the Congress on the effectiveness of existing shoreside ballast water facilities used by crude oil tankers.

It authorized funding for research on aquatic nuisance species prevention and control in the Chesapeake Bay, the Gulf of Mexico, the Pacific Coast, the Atlantic Coast, and the San Francisco Bay-Delta Estuary.

In addition, NISA required a ballast water management program to demonstrate technologies and practices to prevent aquatic nonindigenous species from being introduced into and spread through ballast water in U.S. waters. It modified: (1) the composition and research priorities of the Aquatic Nuisance Species Task Force; and (2) zebra mussel demonstration program requirements.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service is the federal agency that provides federal funding for implementation of state and regional ANS management plans which have been approved by the ANS Task Force.

One of the major USFWS efforts on ANS is the 100th Meridian Initiative. The goals of this Initiative are to 1) prevent the spread of zebra mussels and other ANS in the 100th meridian jurisdictions and west and 2) monitor and control zebra mussels and other ANS if detected in these areas. These goals will be attained through the implementation of the following six components: 1) information and education, 2) voluntary boat inspections and boater surveys, 3) involvement of those who haul boats for commercial purposes, 4) monitoring, 5) rapid response, and 6) evaluation.

This Initiative represents the first large-scale concerted effort, working with Federal, State, Provincial and Tribal entities, potentially affected industries, and other interested parties to begin addressing the pathway to prevent the spread of zebra mussels. The success of this Initiative depends on the commitment of these groups to combat the spread of this destructive invader.

REGIONAL

Pacific States Marine Fisheries Commission/Bonneville Power Administration Aquatic Nuisance Species Program for the Columbia River Basin

In 1999, the Bonneville Power Administration (BPA), recognizing the potential impact to its operations, funded the Pacific States Marine Fisheries Commission (PSMFC) to carry out an ANS prevention program for the Columbia River Basin (CRB). Zebra mussels pose a serious economic and ecological threat to the CRB's multiple uses, such as agricultural, navigation, boating, fishing, industrial, and hydroelectric operations. The PSMFC has also provided funding to Montana to conduct Boat User Surveys and install Traveler Information Systems (TIS) in the state. One of the goals of this regional program is to include ANS outreach and inspection in Montana, Washington, Idaho, and Wyoming.

The Western Regional Panel

The Western Regional Panel (WRP) on Aquatic Nuisance Species was formed under a provision in NISA. The initial, organizational meeting of the WRP was held at Portland State University in 1997. The WRP was formed to help limit the introduction, spread, and impacts of aquatic nuisance species into western North America. This panel includes representatives from federal, state and local agencies and from private environmental and commercial interests.

The purposes of the WRP, as described in NISA, are to:

- identify Western Region priorities for responding to aquatic nuisance species;
- make recommendations to the Federal ANS Task Force regarding an education, monitoring (including inspection), prevention, and control program to prevent the spread of the zebra mussel west of the 100th Meridian;
- coordinate, where possible, other aquatic nuisance species program activities in the West not conducted pursuant to the Act;
- develop an emergency response strategy for federal, state, and local entities for stemming new invasions of aquatic nuisance species in the region;
- provide advice to public and private individuals and entities concerning methods of preventing and controlling aquatic nuisance species infestations; and
- submit an annual report to the Federal ANS Task Force describing activities within the western region related to aquatic nuisance species prevention, research and control.

Western Governors Association

The Western Governors' Association (WGA) is developing a new program to address undesirable nonindigenous aquatic and terrestrial species in the West because of the significant economic and ecological harm they cause. On June 30, 1998, the Western Governors passed Resolution 98-018, Undesirable Aquatic and Terrestrial Species, to develop and coordinate Western strategies and to support management actions to control and prevent the spread and introduction of undesirable species; to support the use of Integrated Pest Management concepts; to encourage broad-based partnerships; and to urge adequate support for the U.S. Department of Agriculture - Animal and Plant Health Inspection Service. Then on June 23, 2002, the Western Governor's passed follow-up Policy Resolution 02-21, Undesirable Aquatic, Riparian, and Invasive Species. A copy of this Policy resolution is in **Appendix H**. This additional resolution reaffirmed the WGA's commitment to this issue and among other things added riparian systems to the action list. WGA has formed a working group of state and federal agencies, industry, non-governmental organizations and academia to develop Western strategies to limit the spread of these species. The invasive species coordinator position in the WGA is not currently funded.

PROBLEMS AND CONCERNS

THREATENED IMPACTS FROM AQUATIC NUISANCE SPECIES

Nonindigenous Aquatic Animals

When species are introduced into a new environment there is the potential for significant ecological, economic, and social effects. Once introduced, there may be no natural controls, such as pathogens, parasites, and predators. Lack of natural controls may allow a population to increase at an exponential rate. Establishment of new species can cause the disruption of native species in the ecosystem as the introduced species may prey upon, out compete, or transmit disease to the native species. The introductions of harmful nonindigenous aquatic nuisance species into Montana waters have already caused severe impacts. These include the elimination of native fishes through competition, hybridization, and altering of habitats. Economic losses also occur and with loss of income due to the loss of sporting opportunities and tax dollars going to the control of these species.

ANS have sprung up across Montana due to intentional or and unintentional actions. Ballast water discharge from ships is the most significant source of unintentional introductions of ANS to coastal and estuarine waters. Ballast water is obviously not a problem in Montana, however animals introduced into the U.S. through the ballast water pathway are a serious threat here. The same principle applies to smaller watercraft in this area. ANS such as the zebra mussel can attach to the hull or fishing gear or be moved in the live wells or bait buckets from one body of water to another.

There are several other pathways through which ANS are introduced. Water diversions allow fish from different drainages to invade new habitats potentially causing serious problems. Importation of fish through the aquarium trade can put bodies of water at risk of invasion. Although aquaculture is well regulated in Montana, the out of state propagation of animals for commercial or recreational purposes provides a potential source for ANS. ANS may be introduced through intentional, illegal releases. This plan provides a reference point to be observed to decrease misguided attempts to change state fishery resources.

Nonindigenous Aquatic Plants

The spread of nonindigenous aquatic plants causes significant economic and ecological problems throughout North America. Invasive, non-native species are one of the leading threats to the ecological integrity of forests, grasslands, and waterways. Recognizing the threat to western aquatic ecosystems and water delivery systems caused by nuisance exotics has raised concerns with representatives from state, provincial, and federal agencies as well as private water interests.

Aquatic vascular plants include ferns and flowering plants that grow submersed in water, float on the water surface, or have basal portions inundated with foliage and upper parts emersed.

Diverse in form and habit, many aquatic plant species have become established in the United States outside of their natural range. Introduced intentionally or escaping from cultivation, nonindigenous plants can colonize aquatic communities where they compete with and often displace native species. Hydrilla (*Hydrilla verticillata*) and Eurasian watermilfoil (*Myriophyllum spicatum*) are examples well known for their ability to alter physical and biological functions of aquatic systems. They impact water quality, recreational uses of water, and fisheries. A wide variety of pondweed (*Potomogeton* spp.) species clog irrigation and drainage ditches. Filamentous and planktonic algae can clog waterways, impact water quality, and produce toxic blooms in lakes and ponds. Emergent species such as purple loosestrife (*Lythrum salicaria*) reduce wildlife cover and habitat. Saltcedar, or tamarisk (*Tamarix* spp) seriously degrades wetlands, completely drying up some lakes, ponds, and river areas.

Pathways for introduction of aquatic plant species include: boats and trailers, the aquarium trade, nursery and garden centers, and mail order and internet suppliers.

Pathogens (including Whirling Disease)

Pathogens may include bacteria, viruses or parasites. They may potentially enter Montana on plants or animals imported into Montana or through the water in which plants or animals are transported. When pathogens are allowed into a new aquatic environment, they have the capability to infect native or existing plants or animals and cause disease. Pathogens introduced into Montana waters can cause disease and are potentially harmful to fish, plants and other animals. Importation of pathogenic organisms must be regulated and spread of these pathogens must be controlled. Organisms, such as *Myxobolus cerebralis*, the parasite which causes whirling disease in Salmonid fish, have the potential to severely impact wild trout fisheries in Montana, resulting in serious loss of recreational activity and financial loss to Montana. Diseases, like whirling disease, are especially devastating to a state like Montana, which relies on wild trout for most of its stream and river fisheries. Viral pathogens present in the Pacific Northwest have resulted in losses of millions of trout and salmon. These viruses must be kept out of Montana through tightly regulated fish import laws.

STATUS OF AQUATIC NUISANCE SPECIES IN MONTANA - PRIORITY FOR ACTION

All nonindigenous species impact native species and habitat in some manner, but not all of them pose a significant threat, and some provide an economic and recreational benefit in certain areas. While it is hard to elucidate the effects that species will have once they are introduced, there are species whose current or potential impacts on native species and habitats and economic and recreational activity in Montana are known to be significant. These ANS are a priority for management actions. At the same time, the ability to manage each species varies greatly, and the resources available are limited. Management efforts must, therefore, be focused on species where actions can produce the greatest benefit. In recognition of the known threats, impacts, and potential problems of certain ANS and the state's current management capabilities, a system to classify species was developed that recommends management activities for each classification. Yet, because impacts either do not occur immediately or may not be apparent until well after establishment, effort must also be devoted to assessing the overall impacts of nonindigenous species, regardless of their classification. The following are examples of species to be addressed by the Montana ANS management plan. This list is not comprehensive, but is provided to illustrate species in each management class. The Plan provides for an on-going assessment of potential priority class species.

PRIORITY CLASS 1

Priority Class 1 species are currently not known to be present in Montana, but have a high potential to invade and there are limited or no known management strategies for these species. Appropriate management for this class includes prevention of introductions and eradication of pioneering populations. Examples of species that need to be addressed under this management class are discussed below.

Zebra Mussel (*Dreissena polymorpha*)

In the late-1980s, the zebra mussel was discovered in Lake St. Clair, between Lake Huron and Lake Erie. Zebra mussels were introduced from Eastern Europe via ballast water discharge from European freighters. This species spread rapidly to 20 states in the Mississippi River drainage. Nationwide expenditures to control zebra mussels in water intake pipes, water filtration equipment, and electric generating plants are estimated at $3.1 billion over 10 years (OTA, 1993).

Zebra mussels can easily survive overland transport from the Midwest to Montana while attached to boat hulls or in live wells, engine cooling systems, or bait buckets. Live zebra mussels have been found at California agricultural stations on boats from the Midwest, and in Washington on boats destined for British Columbia. The zebra mussel is a prolific fouling organism with great potential to disrupt fish passage facilities and cause ecological and economic damage in the Pacific Northwest.

Rusty Crayfish (*Orconectes rusticus*)

Only three species of crayfish are thought to be native in Montana, *Orconectes virilis, Pacifastacus leniusculus and P gambelii. O. immunis,* which has been found in the south central region of the state, is an introduced species (Dr. W. Gould, Professor Emeritus, MSU, Bozeman, MT). The native populations could be seriously impacted by introduction of a non-native species of crayfish, such as the rusty crayfish *O. rustucus*. The rusty crayfish has eliminated native *Orconectes* species and has had serious negative impacts on macrophyte populations in some states. The rusty crayfish has not been found in Montana, but it has been transplanted to new waters in other states resulting in viable populations. Native crayfish are also susceptible to a variety of bacteria and viruses, which could be introduced with non-native crayfish.

Egeria (*Egeria densa*)

Egeria, an aquatic plant from South America, was presumably imported for the aquarium trade. It has few natural predators to keep its growth in check, and when introduced to a lake, it often forms dense mats that displace native aquatic plants. These mats are unsightly, interfere with recreation, and degrade fish habitat.

Hydrilla (*Hydrilla verticillata*)

Hydrilla, another aquatic plant, was imported into the United States from Asia in the early 1950s for use in aquariums, and was likely introduced into the wild near Tampa and Miami, Florida. Hydrilla is currently the most abundant aquatic plant in Florida, where it grows in thick surface mats and displaces native vegetation. Distribution in the United States now ranges from Connecticut southward along the coast to Texas. The plant is also present in California and Washington. Several inland states (Pennsylvania, Tennessee and Arizona) also have populations. Established populations of hydrilla are not known to occur in Montana, although surveillance efforts have been limited. Hydrilla is most likely to spread when plant fragments are carried along with recreational boats into new habitat.

Hydrilla causes major problems with water use. In drainage and irrigation canals, it greatly reduces flow and causes clogging, which can result in flooding and damage to canal banks, structures, and pumps. In utility cooling reservoirs, hydrilla can disrupt flows necessary for adequate water-cooling. Hydrilla can interfere with recreational and commercial vessel navigation. In addition to interfering with boating by fisherman and water skiers, hydrilla hampers swimming, displaces native vegetation communities, and can damage sportfish populations. The economic consequences of aquatic weed infestations can be staggering. Annual expenditures to control aquatic weeds in the United States (most of them nonnatives, such as hydrilla) are reported to be $100 million (OTA, 1993).

Zander (*Stizostedion lucioperca*)

Walleye (*Stizostedion vitreum)* and native sauger (*S. canadense)* have two closely related species in Eastern Europe, the zander or European pike-perch (*S. lucioperca)* and the Volga pike-perch or Volga zander, (*S. volgensis) (*Courtenay and Robins 1989).

The North Dakota Game and Fish Department successfully imported the zander from Finland in 1989 and stocked Spirtwood Lake as an experimental introduction. North Dakota netting surveys did not catch any zander and they concluded that the introduction had failed. In August 1999 an angler caught an age 2+ zander, which was verified by Department of Fisheries and Oceans in Winnipeg. The zander matched the zander from Finland using mitochondrial DNA test. This verified that the North Dakota zander had reproduced. There is a possibility that the zander is in the Missouri River. Spiritwood Lake has overflowed several times into the James River, a tributary of the Missouri River (Courtenay 2001).

Potential impacts of the zander in the Missouri River Drainage fishes include displacement, predation, and hybridization with walleye and sauger. Although the extent of their impact and distribution in the Missouri River is largely unknown it would be prudent to keep them out of Montana waters.

Round Goby (*Neogobius melanostomus*)

This fish is a bottom-dwelling fish, native to eastern Europe that entered the eastern Great Lakes in ballast water. They can spawn several times per year, grow to about 10 inches, are aggressive, and compete with native bottom-dwellers. The round goby, was introduced, via ballast water, into the St. Clair River and vicinity on the Michigan-Ontario border where several collections were made in 1990. The numbers of native fish species have declined in areas where this goby has become abundant. The round goby has been found to prey on darters, other small fish, and lake trout eggs and fry in laboratory experiments (Marsden, J. E., and D. J. Jude, 1995). The round goby's potential range includes Montana.

Ruffe (*Gymnocephalus cernuus*)

The ruffe (*Gymnocephalus cernuus*) is a small perch-like Eurasian fish. It was apparently introduced to the Great Lakes in the St. Louis River near Duluth, Minnesota from a ballast water discharge. In Europe the ruffe feeds on whitefish eggs and competes with other more desirable fish. The spiny dorsal fins of the ruffe discourage predation by other fish. In Lake Superior, the species of fish that is most affected by the ruffe is the yellow perch. Populations of perch have declined up to 75% in water bodies where the ruffe have become established. If established in Montana, there could be serious affects to our lake and reservoir fisheries.

Spiny Water Flea (*Bythotrephes cederstroemi*)

The spiny water flea is not actually an insect, but a tiny (less than half an inch long) crustacean with a long, sharp, barbed tail spine. A native of Great Britain and northern Europe east to the Caspian Sea, the animal was first found in Lake Huron in 1984, probably imported in ballast water of a transoceanic freighter. Since then populations have exploded and the animal can be found throughout the Great Lakes and some inland lakes.

The effects spiny water fleas will have on the ecosystems of the Great Lakes region are unclear. The animals may complete directly with young fish for food, such as Daphnia zooplankton. Spiny water flea also reproduces rapidly. During warmer summer conditions, each

female can produce up to 10 offspring's every two weeks. As temperatures drop in the fall, eggs are produced that can lie dormant all winter.

It is not known if this exotic will have larger impacts on inland lakes. Spiny water fleas eggs and adults spread unseen in bilge water, bait buckets, and livewells. In addition, fishing lines and downriggers will often be coated with both eggs and adults.

Heterosporosis (Parasite of perch and other fish species)

Heterosporosis is a microscopic parasite, which has the potential to infect several fish species resulting in muscle lesions and can cause serious harm to fish. The parasite was first reported in yellow perch, but may also be found in walleye, northern pike, fathead minnows or other fish species. This parasite has been reported in fish in Minnesota and Wisconsin. It has never been reported in Montana, but has the potential to become established in Montana fish if infected fish are imported into Montana. The parasite causes milky white lesions with a granular texture in fish fillets. Severity of the infection will vary between infected fish populations, but in heavily infected fish as much as 80% of the fillet may be affected.

Infectious Hematopoietic Necrosis (IHN)Virus

IHN virus is an example of a pathogen, which is not currently known to occur in Montana, but which has the potential to cause serious mortality if it is introduced. It is a pathogen known to occur in fish in states west of Montana. We must constantly be on guard to ensure it is not imported into Montana with fish imported from other states. For this reason, IHN virus and other viral pathogens are listed as "pathogens of concern" on Montana import and disease laws. Fish may not be imported into Montana unless they have been tested and found free of IHN virus.

Carp (*Various Species*)

The black carp (*Mylopharyngodon piceus*) has been approved for release for stocking commercial aquaculture ponds to control snails and will surely escape into the wild just as the other three species of Asian carp, the silver (*Hypophthalmichthys molitrix*), bighead (*H. nobilis*) and the grass carp (*Ctenopharyngodon idella*) have. The latter three species were released in the 70s, 80s and early 90s for aquaculture and pond applications and have now developed large wild populations in the Missouri River basin. Large numbers have been reported below Gavins Point Dam in South Dakota and it is quite likely that they will get past the dam one way or another and proceed up the Missouri River. The bighead carp, a plankton feeder may compete for food with paddlefish and bigmouth buffalo, as well as with forage fishes. The bighead has no known human use as the flesh is not desirable. All three species compete for food with the larval stages of our native game fish. These carp also have the ability to capitalize on inundated river habitats such as Fort Peck Reservoir. Although the extent of their impact and distribution in the Missouri River is largely unknown it would be prudent to keep them out of Montana waters.

PRIORITY CLASS 2

Priority Class 2 species are present and established in Montana and have the potential to spread in Montana and there are limited or no known management strategies for these species. These species can be managed through actions that involve mitigation of impact, control of population size, and prevention of dispersal to other waterbodies. Examples of species addressed under this management class are discussed below.

New Zealand Mud Snail (*Potamopyrgus antipodarum*)

Native to New Zealand but long established in Australia and Europe, this species was discovered in North America in 1987 in the Snake River in south-central Idaho. Population levels can exceed 100,000 snails per square meter (NCSE, 1999). New Zealand mud snails (NZMS) have become established in every major river drainage in Yellowstone National Park, in the Madison River Drainage in Montana, at several other locations in the western U.S., and in Lake Ontario, New York. Modes of transportation may include hitchhiking on recreational equipment and other equipment used in water, in the guts of harvested or illegally transported fish, or via transport on waterfowl and other aquatic birds. Effects on native aquatic invertebrates are being documented in the Madison River and in Darlington Ditch, a small stream along the lower Madison River. NZMS degrade habitat due to their high reproductive capacity and the subsequent impacts on invertebrate food sources. Fish receive little, if any, nutritive value from eating the snail. The snail has an operculum that it closes when threatened, which prevents digestive juices from reaching the soft tissue of the snail's body when ingested by fish.

Whirling Disease (*Myxobolus cerebralis*)

Whirling disease is caused by a metazoan parasite that infects cartilage tissue of most Salmonid species. The whirling disease parasite was first introduced to the United States from Europe in the 1950s, probably through trout infected in Europe. This parasite has a two-host life cycle which includes both the primary Salmonid host and a common aquatic worm (*Tubifex tubifex*). Infective spores are produced in each host and are capable of spreading the disease in a variety of ways. The disease is now known to occur in over 20 states. Whirling disease has become a major problem in some western states, and has caused major declines in some wild rainbow trout populations and is especially severe in Colorado and Montana. Currently whirling disease has been found in over 95 bodies of water in Montana with severe infections in the Madison River, mid-Missouri River near Helena, Rock Creek near Missoula, Big Blackfoot River and many smaller wild trout streams. In the Madison River, population declines in wild rainbow trout have been as high as 80% (Vincent, 1996).

Nutria (*Myocastor coypus*)

One of Montana's few known aquatic nonindigenous mammals is the nutria, *Myocastor coypus*. It is found in and around fresh and saltwater ponds and swamps. Nutrias were initially introduced into North America and farmed for their fur. Since their introduction, some animals have escaped these farms and established localized breeding populations from Texas to Virginia

and in the Great Lakes area. Presently, they are considered to be a pest species in some areas, disrupting irrigation systems and destroying native aquatic vegetation and crops. Additionally, by disturbing the balance of the native biota they provide an advantage for non-native plant species to become established.

PRIORITY CLASS 3

Priority Class 3 species are not known to be established in Montana and have a high potential for invasion and appropriate management techniques are available. Appropriate management for this class includes prevention of introductions and eradication of pioneering populations. Examples of species that need to be addressed under this management class are discussed below.

Eurasian Watermilfoil (*Myriopyllum spicatum*)

Eurasian watermilfoil (EWM) was accidentally introduced to North America from Europe. Spread westward into inland lakes primarily by boats and water birds, it reached the Midwestern states between the 1950s and 1980s. A key factor in the plant's success is its ability to reproduce through stem fragmentation and runners. A single segment of stem and leaves can take root and form a new colony. Fragments clinging to boats and trailers can spread the plant from lake to lake. Once the plant is established it is almost impossible to eradicate it.

Asian tapeworm (*Bothriocephalus acheilognathi*)

The Asian tapeworm is not known to be present in Montana at this time. As with any fish pathogen or parasite, if the Asian tapeworm is introduced and does become established in Montana, it will be extremely difficult or impossible to eradicate. For this reason, it is essential that this parasite not be introduced into Montana waters. The Asian tapeworm may infect many species of game, forage and bait fish. It has the potential to do serious harm to fish if introduced into Montana waters. This parasite was introduced into the United States through shipments of infected grass carp from China. It has spread into several states with infected fish. The tapeworm can result in mortality, but most often is responsible for reduced growth and poor condition of infected fish.

PRIORITY CLASS 4

Priority Class 4 species are present and have the potential to spread in Montana but there are management strategies available for these species. These species can be managed through actions that involve mitigation of impact, control of population size, and prevention of dispersal to other waterbodies. Examples of species addressed under this management class are listed below.

Purple Loosestrife (*Lythrum salicaria*)

Purple loosestrife is a wetland invader that was imported from Europe in the early 1800s for its medicinal value and for the beautiful purple spikes of the blooming plant. Unsuspecting visitors to an infested wetland often admire the beauty of the marsh when purple loosestrife is in bloom, unaware that it has displaced native plants and animals. Its vegetative dominance may increase the likelihood of listing additional native species under the ESA. Purple loosestrife is still sold as an ornamental in nurseries in some states, though 24 states, including Montana, have listed it as a noxious weed and prohibit its sale. It is found in 42 of the contiguous states, and could invade the remaining six. The plant is extremely difficult to eradicate although recently a suite of biological control agents have proven effective in suppressing the plant. Estimated losses are $45 million per year in control costs and forage loss (ATTRA, 1997). The Montana Purple Loosestrife Task Force has developed a statewide management plan for this species and active eradication programs are currently underway in Lake and Cascade counties in Montana..

Yellow Flag Iris (*Iris pseudacorus)*

Yellow iris is a rhizomatous emersed wetland forb. It has very showy yellow iris flowers, and is a tall plant with long, flat, dark green, sword-like leaves. This invasive plant propagates by both seed and underground rhizomes. The draught tolerant rhizomes break off, and spread downstream, as does the seed. Poisonous if ingested, and irritating to the skin, yellow iris is fast growing, fast spreading, and very competitive. It forms almost impenetrable thickets. It was brought into the United States in the early 1900's as an ornamental and has been used for erosion control, as a dye and fiber plant, and in sewage treatment cells. In Montana, Lake County suffers from invasion throughout the irrigation ditch systems and the wetlands, as well as spreading down the Flathead River into Sanders County. It is also well established in Missoula and Flathead counties.

Flowering Rush (*Butomus unbellatus*)

Flowering rush was introduced through the North American shipping trade at the turn of the century in ballast as long-lived seed and possibly reproductive bulblets into the ecosystems of Quebec and Michigan. Use as an ornamental provided this invasive plant another route to the Midwest and expedited it's spread westward to the Idaho panhandle and Northwestern Montana, where it is reported to be out-competing the native willows and cattails. An emergent in shallow areas of lakes, flowering rush has umbellate pink flowers and grows to 3 (three) feet tall on triangular stems. It has a submersed form also, which can grow in water 10 (ten) feet deep.

Saltcedar (*Tamaricaceae spp.)*

This invasive small tree or large shrub remains a popular ornamental despite its classification as a "successful" weed. Thousands of tiny pink to white flowers are produced throughout the spring and summer. One mature plant can produce ½ million seeds each year. As well as reproducing by the wind and water borne seed, saltcedar can reproduce vegetatively. Large saltcedar plants ca use up to 200 gallons of water a day; reducing and even eliminating water flow. It out-competes native plant communities, degrades wildlife habitat and has resulted

in the decline of many species. Tamarisk reduces recreational and agricultural use, and increases wildfire frequency. In Montana, counties east of the divide are experiencing a tremendous impact from the rapid spread of the competitive saltcedar. Western Montana has an abundance of ornamentals that pose a threat. A very active group of weed fighters are working together to develop a Montana Saltcedar management plan that targets a statewide survey, containment, and eradication program.

Nonindigenous fish (rainbow, brook, lake and brown trout, bass, walleye, Northern pike, and other warmwater fish species) amphibians (bullfrogs), and other vertebrates (nutria).

These species have been introduced, intentionally and unintentionally, into Montana and are well established in some areas. Fish and bullfrogs have been implicated in the decline of native Salmonids and amphibians. Impacts of introduced fishes on native fish species include predation, introduction of diseases and parasites, competition for food and space, and hybridization. In some cases non-natives may be controlled for conservation and restoration of native species. Some species, *e.g.* walleye, largemouth bass, lake trout and rainbow trout, are the basis of popular fisheries that provide recreational benefit to many Montanans. In addition, recreational angling can provide substantial economic benefits to local economies. While these species have established populations, there are areas of the state where they do not occur, and management should be directed at limiting their spread.

Bacterial fish pathogens

Bacterial fish pathogens, such as *Aeromonas salmonicida* (Furunculosis), are present in some Montana watersheds. *Aeromonas salmonicida* is the bacterial pathogen that causes a disease known as furunculosis in fish. This bacterium is known to occur in several Montana watersheds. In the wild it generally does not cause serious problems in fish. However, when fish become stressed, the pathogen can result in a disease problem with high potential mortality. Management actions that can reduce elevated water temperatures or other stress factors may have a significant impact on reducing impact of this pathogen on fish. Furunculosis in a hatchery can often be successfully treated with antibiotics. Because of the potential negative impact of this fish pathogen on Montana's wild and cultured fisheries, import and transport of fish infected with this pathogen should be closely regulated. Montana law prohibits the importation of live fish infected with this bacterial fish pathogen and other known bacterial pathogens.

MANAGEMENT ACTIONS

The goal of the Montana ANS Management Plan is to:

Minimize the harmful ecological, economic, and social impact of ANS through prevention and management of introduction, population growth, and dispersal of ANS into, within, and from Montana.

The goal will be achieved through implementation of a plan that:

- emphasizes prevention of introductions;
- requires an impact assessment and review for all aquatic nonindigenous species prior to their importation, transport, or use in Montana;
- allows for early detection;
- includes development of contingency plans;
- permits appropriate and timely management response to new and existing populations;
- protects and restores native plant and animal communities;
- provides for easy access to accurate and up-to-date species distribution and management information;
- incorporates education and research elements;
- recommends funding levels adequate for effective implementation;
- produces agency collaboration through an invasive species council;
- facilitates inter-jurisdictional coordination with state, federal and tribal agencies; and
- seeks cooperative solutions with the private sector and user groups.

It is not possible to address all potential invaders, their impacts, and the constraints and contingencies that may develop. Consequently, this plan is intended to be adaptable to changing circumstances. The activities and priorities of the plan will be reviewed regularly with a report produced by the Aquatic Nuisance Species Task Force, which will include recommendations for updating and modifying management activities and priorities.

Please note the following abbreviations used for the agencies implementing ANS strategies and actions on the following pages.

Agencies alphabetized by abbreviation: Animal & Plant Health Inspection Service (APHIS), Bureau of Reclamation (BOR), Department of Immigration and Naturalization Border Patrol (BP), Bonneville Power Administration (BPA), Corps of Engineers (COE), Coast Guard (CG), Columbia River Aquatic Nonindigenous Species Initiative (CRANSI), Montana Department of Commerce (DOC), Confederated Salish-Kootenai Tribe (CSKT), Montana Department of Environmental Quality (DEQ), Montana Department of Transportation (DOT), all federal agencies (Fed), USDA Forest Service (FS), Montana Department of Fish, Wildlife and Parks (FWP), U.S. Fish and Wildlife Service (FWS), Governor (Gov), Invasive Species Council and Coordinator (ISC & Coord), Montana Legislature (Leg), Montana Cooperative Extension Services (MCES), Montana Department of Agriculture (MDA), Montana Highway Patrol (MHP), Montana Native Plant Society (MNPS), Montana State University (MSU), National Park Service (NPS), Natural Resources Information Service (NRIS), private utility companies (Private), Pacific States Marine Fisheries Commission (PSMFC), all state agencies (state), University of Montana (UM).

OBJECTIVE 1: COORDINATE AND IMPLEMENT A COMPREHENSIVE MANAGEMENT PLAN.

Problem Addressed: There is no clear authority or agency charged with limiting and managing ANS. Most management activities are focused on isolated problems and not concerned with addressing the issue of ANS comprehensively. The lack of coordination, oversight, and funding has allowed many nuisance species to become established in Montana, and permits new introductions.

Establishment of a management plan with appropriate implementation, authority and resources will permit effective prevention and management of ANS. Most importantly, native species can be protected from the competition, introduction of parasites and diseases, and predation caused by some ANS.

Current Agency Activities

Montana Department of Agriculture

State Weed Strategy. The Montana Weed Summit Steering Committee, in cooperation with the Montana Department of Agriculture, has developed a strategy for addressing weed problems in Montana. This ANS Plan is being developed in conjunction with the Montana Weed Management Plan.

Technical Assistance. The MDA provides technical assistance for the management of aquatic weeds.

Department of Fish, Wildlife and Parks

The FWP department writes Management Plans on major water bodies or programs in need of management.

Gaps in State Management Programs and Authorities

- Authorities are unclear.
- Activities are uncoordinated in the State and Region
- Staffing shortages and lack of funding.

Recommended Strategies and Actions

The lead agency for each action is indicated in parenthesis. Each task will require cooperation, collaborations, and participation of other state and federal agencies, private industry groups, and public interest groups. Explanations of agency abbreviations can be found in the implementation table.

Strategy 1A: Coordinate all ANS management programs and activities within Montana.

1A1. Continue the Montana ANS Steering Committee. (Gov, FWP, MDA)

1A2. Create and fund an ANS coordinator position using ANS Task Force monies and matching funds. (FWP, ISC & Coord)

1A3. Identify key personnel in state government for ANS responsibilities. (FWP, MDA)

1A4. Identify and coordinate with key personnel in federal, tribal governments, and private entities for ANS responsibilities. (ISC & Coord)

1A5. Establish and administer a permit program for ANS management efforts patterned after the Oregon example (ISC & Coord)

1A6. Develop an ANS management class for agency personnel, watershed council coordinators, and others. (ISC & Coord)

1A7. Conduct an annual forum focused on ANS in Montana and potential management alternatives. (ISC & Coord)

1A8. Work to ensure that the ANS strategy is coherent and consistent throughout Montana. (ISC & Coord)

1A9. Develop ANS assessment guidelines as needed for local government or coordinating bodies. (ISC & Coord)

1A10. Develop a list of all established nonindigenous aquatic species present in Montana and develop management strategies for dealing with them as listed by priority class. (ISC & Coord)

1A11. Develop a set of uniform definitions and terms to describe aquatic nuisance species. (ISC & Coord)

1A12. Develop and implement a Rapid Response Plan. See **Appendix H** for complete version of the Rapid Response Plan being adopted. (ISC & Coord)

Strategy 1B: Participate in and support regional, federal, and international efforts to control ANS.

1B1. Participate in the Aquatic Nuisance Species Task Force's Western Regional Panel. (ISC & Coord)

1B2. Support the PSMFC regional coordination effort. (ISC & Coord)

1B3. Support the 100th Meridian Project. (ISC & Coord)

1B4. Coordinate with Canadian provinces and neighboring states. (ISC & Coord)

1B5. Support the Columbia River Aquatic Nonindigenous Species Initiative (CRANSI). (ISC & Coord)

Strategy 1C: Increase existing funding and resources for ANS management and establish new funding and resources.

1C1. Create stable funding sources for ANS management in Montana by seeking federal funding from the NANPCA Act and other potential funding sources. (ISC & Coord)

1C2. Develop partnerships with private groups to fund prevention and eradication efforts. (ISC & Coord)

Strategy 1D: Review and evaluate state efforts in addressing ANS.

1D1. Conduct a periodic assessment of ANS species presence and abundance in Montana. (FWP, MDA)

1D2. Update of the state ANS plan as needed, with annual progress reports and a five-year program report. (ISC & Coord)

OBJECTIVE 2: PREVENT THE INTRODUCTION OF ANS INTO MONTANA.

Problem Addressed: There are many different pathways by which new species can arrive in Montana. Species that provide sportfishing opportunities, erosion control, food, and aesthetic enjoyment have been intentionally brought to Montana and released into the wild or escaped from private ponds or holding facilities. Common carp, goldfish, bass, nutria, milfoil, and parrotfeather can become established through these pathways. Humans, through recreational, development, and management activities (including fire suppression), may unintentionally introduce ANS. ANS introduced and established in neighboring states and Canada may be dispersed into and throughout Montana by natural means such as transport on domestic or wild birds and animals.

Understanding how various pathways function as conduits for ANS into Montana is critical for intercepting species and preventing introductions. Little is known about the species transported, their origins, and the potential for introduction associated with the various pathways. Yet, the most effective method to control ANS and their impacts is to prevent their introduction.

Implementation of a program that reviews and regulates which species are intentionally allowed into Montana, and monitors the pathways by which species can be unintentionally transported into Montana, is necessary to slow the rate at which new species become established.

Current Agency Activities

Department of Agriculture

Annual nursery inspection program. MDA maintains a program to inspect nurseries that includes surveying for noxious weeds.

Species review process. MDA maintains a list of plant species that are classified as noxious and, therefore, prohibited from importation, transport or sale within the state.

Department of Fish, Wildlife and Parks

Montana's import statutes requires all species requested for importation to undergo a review process that will ensure that they do not pose a threat to native species and habitat.

University of Montana (Missoula)

Aquatic Vegetation Surveys. The University of Montana has proposed a research project that will identify suitable habitat for Eurasian watermillfoil, hydrilla, and other invasive aquatic plants in various lake access locations in Montana. The project will map the substrates of lake bottoms that potentially could support these species. Identification of suitable habitat will allow researchers to monitor potential new infestations throughout the state.

Pacific States Marine Fisheries Commission

Zebra Mussel Boat Survey. PSMFC recently completed a survey to determine if recreational boaters were transporting zebra mussels and whether individuals were aware of the threat posed by zebra mussels. Montana participated in this boat survey during the summer of 2000 and 2001.

The FWS, through PSMFC, has also funded and FWP installed a Traveler Information Station (TIS) in NW Montana. Two or 3 more TIS's are being considered for funding by PSMFC for locations in Montana. Their locations have not been determined but potential locations include Eastern Montana (near Fort Peck Reservoir) and south–central Montana near Yellowstone National Park.

Gaps in State Prevention Programs and Authorities

- Limited authority and funding to quarantine species and points of origin.
- Limited funding to enforce laws relating to ANS.
- New plant species are not reviewed before importation.
- Limited enforcement ability over mail order or internet sales of organisms.
- Limited inspection programs.

Recommended Strategies and Actions

The lead agency for each action is indicated in parenthesis. Each task will require cooperation, collaborations, and participation of other state and federal agencies, private industry groups, and public interest groups.

Strategy 2A: Research and address pathways of introduction.

2A1. Describe invasion pathways and identify high-risk waterbodies. (FWP, MDA)

2A2. Investigate and encourage the development of an inspection program for trailered boats and water-based equipment entering Montana. (ISC & Coord)

2A3. Work with importers to monitor the potential for importation practices to introduce ANS into uncontrolled environments. ((ISC & Coord, FWP, MDA, Commerce, APHIS)

2A4. Establish a boat washing program to reduce ANS spread and investigate installing washing stations at public boat ramps. (ISC & Coord)

Strategy 2B: Increase enforcement and awareness of existing laws controlling the transport, propagation, sale, collection, possession, importation, purchase, cultivation, distribution, and introduction of ANS.

2B1. Increase the priority of enforcing ANS laws. (FWP, MHP, MDA, County Weed Districts)

2B2. Train enforcement personnel on ANS identification and regulations. (FWP, MDA)

2B3. Distribute information on ANS laws to businesses that import or sell aquatic organisms. (FWP, MDA)

2B4. Publicize existing penalties for the intentional introduction of any nonindigenous species to Montana's waters. (FWP)

2B5. Examine existing ANS regulations and penalties to determine their effectiveness. (FWP, MDA)

Strategy 2C: Prohibit, control, or permit the importation of nonindigenous aquatic species based upon their invasive potential.

2C1. Research invasiveness of aquatic plant species currently imported. (FWP, MDA, APHIS)

Strategy 2D: Promote legislation and regulatory rules that establishes or increases the state's authority to control the introduction of new species.

2D1. Establish the authority to detain and require cleaning of any vehicle, vessel or water based equipment containing or infested with ANS that is traveling in Montana. (Leg/Gov)

2D2. Increase the ability of the State to regulate the importation of aquatic organisms. (Leg/Gov)

2D3. Establish the authority to quarantine waterbodies to prevent ANS from spreading and to contain ANS for future eradication. (Leg/Gov)

2D4. Require that any intentionally imported organism is free of diseases, parasites, and other unpermitted organisms. (MDA/FWP)

2D5. Develop cooperative agreements with states and provinces that share common waters. (Leg/Gov/ ID, ND, SD, WY, British Columbia, Alberta, Saskatchewan).

OBJECTIVE 3: DETECT, MONITOR AND ERADICATE PIONEERING AQUATIC INVASIVE SPECIES.

Problem Addressed: Once invasive species have arrived there is often a window of opportunity to eradicate small pioneering populations before they become a nuisance, yet often species are not detected until nuisance populations are formed. Usually, it is too late or too expensive to eradicate a species once it has reached a nuisance level, and when management is conducted after a population is well-established, long-term routine activities will often be required to control the population and reduce environmental impacts.

By initiating a detection and monitoring program, the state will be able to discover and manage pioneering infestations at a point when the species can be eradicated in a cost effective manner.

Current Agency Activities

Department of Agriculture

Noxious Weed Surveys. MDA conducts a limited survey for noxious weeds. Counties have the responsibility to map all state-listed noxious weeds.

Department of Fish, Wildlife and Parks

Fish Surveys. FWP routinely surveys fish populations which includes nonnative fish, including some invertebrate sampling.

Montana State University

New Zealand Mudsnails. MSU is conducting work on distribution of NMS and their impacts on other aquatic invertebrate populations in Montana.

Department of Environmental Quality

Water Quality Surveys. DEQ does some invertebrate sampling.

Gaps in State Monitoring and Eradication Programs and Authorities

- No agency is actively and routinely monitoring or surveying for ANS.
- The authority and funding to quickly deal with new ANS is lacking.
- Agencies lack the authority to quarantine a specific water body once an ANS is introduced.
- Response time to an invasion is slow due to a lack of contingency plans and funding.

Recommended Strategies and Actions

Strategy 3A: Implement a surveillance and early detection program.

3A1. Conduct an annual survey of high-risk waters . (FWP, MDA)

3A2. Encourage and train citizen-monitoring networks to work in cooperation with state agencies. (ISC & Coord)

3A3. Distribute zebra mussel colonization substrates (bricks) for individuals to deploy and monitor. (FWP)

3A4. Develop and implement a monitoring and surveillance program for all ANS. (ISC & Coord)

3A5. Early detection surveys for Eurasian water milfoil, hydrilla, and other aquatic plants. (UM, FWP, MSU)

Strategy 3B: Develop an early response mechanism to deal with detected and potential invasive species.

3B1. Develop a Rapid Response Plan for all ANS species. (ISC & Coord, FWS)

3B2. Identify possible funding sources for implementing Rapid Response Plan actions. (ISC & Coord)

Strategy 3C: Eradicate pioneering populations of ANS.

3C1. Continue current eradication and management programs for purple loosestrife, Eurasion watermilfoil and New Zealand mud snail. (MDA/Co Weed Districts, FWP)

OBJECTIVE 4: WHERE FEASIBLE, CONTROL AND ERADICATE ESTABLISHED ANS THAT HAVE SIGNIFICANT IMPACTS.

Problem Addressed: Established ANS species often create the most noticeable impacts, yet they are often impossible to eradicate or control. Management activities are most effective when they are directed at limiting the impacts of a population or stopping that population from spreading to new waterbodies. Also, once established, new species are often difficult to remove.

Management activities must be focused on populations of established species where there is a clear and significant impact on native species, and where the control or eradication of specific populations is feasible both economically and technically.

Current Activities

Montana Department of Agriculture (MDA)

Purple loosestrife control. MDA is conducting experiments on the efficacy of two biocontrol agents to control purple loosestrife.

Montana Fish, Wildlife, & Parks (FWP)

FWP has aggressively pursued eradication of undesirable and non-native species of fish in select locations or as a result of illegal introductions, proposed to eradicate a population of NZMS in a small stream, and established a whirling disease research and management program. FWP supports the EPA registration and use of the fish pesticides (a.k.a. piscicides) rotenone and antimycin to make waters available for native fish conservation and expansion, such as for cutthroat trout and bull trout, and to eradicate illegally introduced fish, such as Grass Carp.

Gaps in State Control and Eradication Programs and Authorities

- No state agency has a clear program directed at controlling or eradicating ANS.
- Current efforts are directed at individual populations and not at controlling a species distribution and extent.

Recommended Strategies and Actions

Strategy 4A: Limit the dispersal of established ANS to new waterbodies or to new areas of a waterbody.

4A1. Establish a boat washing program to reduce ANS spread and investigate installing washing stations at public boat ramps. (FWP, FS, BPA, Tribes, NPS, COE, BOR, others)

4A2. Try to limit the spread of existing ANS by the public, by reducing the disturbance of existing populations through the use of warning signs, buoys, and possible closures in infested areas. (FWP, MDA)

4A3. Investigate the inclusion of ANS information on signs and kiosks at infested waterbodies. (Fed, Tribes, Private, FWP)

Strategy 4B: Control known nuisance populations where economically and technically feasible.

4B1. Continue the use of purple loosestrife biocontrol agents. (CSKT, FWP, MDA)

4B2. Develop and implement aquatic weed management plans. (MDA, Co Weed Districts)

4B3. Provide technical assistance to watershed councils, conservation districts, irrigation districts, lake associations and other local boards for development of management plans. (FWP)

4B4. Continue to investigate management strategies to minimize the impacts of M. cerebralis (Whirling Disease) and New Zealand Mudsnail, tamerisk (Salt Cedar), etc. (FWP, MDA, MCES)

OBJECTIVE 5: INFORM THE PUBLIC, POLICY MAKERS, NATURAL RESOURCE WORKERS, PRIVATE INDUSTRY, AND USER GROUPS ABOUT THE RISKS AND IMPACTS OF ANS.

Problem Addressed: The lack of awareness concerning ANS impacts is one of the largest management obstacles. Few people understand the threat some nonindigenous species pose and how their actions might introduce them. Uninformed people, through the dumping of an aquarium or a bait bucket, launching of a contaminated boat, or stocking of a private pond have introduced many ANS. The improper importation and holding of organisms have allowed species to escape, or caused the receipt of unwanted organisms mixed in with intentionally imported ones. Many policy makers, natural resource administrators, and private interest groups have facilitated the intentional introductions of species for certain economic or recreational purposes without understanding the effects these species would have on native species. These intentional and unintentional methods of introduction can be eliminated or curtailed by educating people to their potential to transfer nonindigenous species to Montana.

It is also important to prevent spreading species within the state. Montana has three major and different aquatic ecosystems: the Columbia, Yellowstone and Missouri. If species cross these drainage divides they enter major routes for transportation in Montana and states connected to the affected basin. These undesirable introductions apply not only to nonindigenous species, but also to native species, such as Yellowstone cutthroat from east of the Continental Divide, which could cross with Westslope cutthroat from west of the Continental Divide, if given the opportunity. It is critical to inform people of the importance of keeping live species in their "home" waters.

Current Agency Activities

Department of Fish, Wildlife, & Parks

ANS information. FWP has included information on ANS in the state fishing regulations, posting of signs, purchase and distribution of videos, articles in FWP Montana Outdoors, and conducted direct mailings.

Pacific States Marine Fisheries Commission/ U.S. Forest Service

ANS outreach. PSMFC and USFS provided joint funding for establishment of a Traveler Information System (TIS) in northwest Montana. And will provide additional funding in 2002 for 2 or more TISs in eastern and southern Montana.

Montana State University Extension Service

Information and education. MSU provides research-based weed information and informal education programs to individuals, businesses, and communities. A variety of extension programs include invasive species issues.

Corps of Engineers

Monitoring activities are being conducted at their sites.

U.S. Fish & Wildlife Service

Training, signing, and production of informational brochures have been developed for distribution.

PPL Montana

Monitoring activities are being conducted at their sites.

Gaps in State Education Programs and Authorities

- ANS is not addressed as an issue.
- Inadequate information is disseminated to the public.

- Few natural resource workers have the training to identify ANS.
- Little training is provided to agency and private personnel about ANS.
- Few efforts are made to involve potentially interested citizens in ANS issues.

Recommended Strategies and Actions

Strategy 5A: Educate the public about ANS, how their actions can prevent the spread and introduction of ANS and how they can help reduce the impacts of existing ANS.

5A1. Incorporation of ANS information into boat operator classes. (FWP, CG)

5A2. Create an educational curriculum on ANS for schools. (ISC & Coord)

5A3. Produce press releases and PSA's on specific ANS. (ISC & Coord)

5A4. Create articles, videos, billboards, TIS systems and web-based media concerning ANS. (ISC & Coord, FWP)

5A5. Distribute information on ANS at various conferences, shows, tournaments, and public gatherings. (ISC & Coord, FWP, MDA, Other Cooperators)

5A6. Continue to include information on ANS in state hunting, fishing, and boating regulations. (FWP)

5A7. Develop ANS identification cards for public distribution. (ISC & Coord, FWP)

5A8. Develop a "Montana friendly" plant labeling system in conjunction with the nursery industry. (MDA, MNPS)

5A9. Inform policy makers on the extent, impact, and potential for harm of ANS. (ISC, Cooperators)

5A10. Continue to expand upon the Traveler Information System (TIS) across the state at key locations. (FWP, DOT, PSMFC)

5A11. Network with other existing aquatic education programs. (fed, state, private)

Strategy 5B: Train appropriate personnel in ANS identification.

5B1. Conduct identification seminars. (ISC & Coord)

Strategy 5C: Educate private industry on the laws regulating and effects of ANS.

5C1. Create a pamphlet for the nursery industry identifying ANS, the laws regulating them, and their effects in natural systems. (ISC & Coord, MDA)

5C2. Distribute information on ANS to businesses selling aquatic organisms such as pet stores and bait dealers. (ISC & Coord, FWP)

5C3. Provide information to fishing tournament organizers on ANS. (ISC & Coord, FWP)

5C4. Identify and provide ANS information to all other persons or businesses operating in water bodies. (ISC & Coord, FWP)

OBJECTIVE 6: INCREASE AND DISSEMINATE KNOWLEDGE OF ANS IN MONTANA THROUGH COMPILING DATA AND CONDUCTING RESEARCH.

Problem Addressed: Little is known about the extent and magnitude of the ANS problem in Montana, in fact many more nonindigenous species may occur in Montana than are recognized. Information and research is needed to quantify and clarify the effects that nonindigenous species are having on native species and habitat. Research can identify the threat posed by specific nonindigenous species and the mechanism responsible for transferring those organisms. By compiling available information and by providing quick access to information on taxonomy, management methods, and experts to contact the response to new ANS can be quick, and existing ANS can be readily recognized and managed.

Current Agency Activities

Department of Fish, Wildlife and Parks (FWP)

ANS impact research. FWP has investigated the interactions and impacts of nonindigenous fish species on native species, cooperated with NZMS research and is the lead agency on whirling disease research.

Montana State University

Ongoing research on NZMS and introduced fish.

US Fish & Wildlife Service

Funding for NZMS research is ongoing.

Pacific States Marine Fisheries Commission

ANS boater survey.

Gaps in State Programs and Authorities

- Poor understanding of basic biology and impacts of ANS.
- Limited management options.
- Little funding is available to conduct research and management activities.

Recommended Strategies and Actions

Strategy 6A: Research ANS for their impact on biota utilizing regional efforts & literature searches.

6A1. Develop a better understanding of basic biology and impacts of introduced aquatic plants and animals. (MSU/UM)

6A2. Evaluate the potential for aquarium and live food fish to serve as vectors of disease and parasites to native fish populations. (FWP/FWS)

6A3. Continue investigation on the effects of the New Zealand mudsnail. (MSU)

6A4. Continue investigation on the effects of the M. cerebralis. (MSU, UM, FWS, FWP)

Strategy 6B: Research management alternatives for their effect on ANS and native species.

6B1. Investigate the relationship between human-induced disturbance of aquatic and riparian systems and ANS invasion, establishment, and impacts. (FWP, MSU,UM, Fed)

6B2. Investigate and develop new and innovative methods of managing ANS. (MSU, UM, FWP)

6B3. Evaluate herbicide effects. (MDA, MSU)

Strategy 6C: Facilitate the collection and dispersal of information, research, and data on ANS in Montana.

6C1. Create a central repository of reference material on ANS. (NRIS)

6C2. Create and coordinate a central database of information on ANS. (PSMFC)

6C3. Build and maintain a website on ANS in Montana. (NRIS, FWP)

6C4. Utilize existing field personnel to document the distribution and abundance of ANS. (FWP, Fed, Private)

6C5. Develop and maintain a list of taxonomic experts for ANS identification. (ISC & Coord)

IMPLEMENTATION TABLES

The tables that follow identify the responsible agency or agencies and the proposed funding necessary to fully implement the Montana ANS Plan. Funds for implementing the Plan will be administered by the proposed **Invasive Species Council (ISC)**. Legislation used by Oregon to create a similar council is provided in **Appendix I** and will be used as a model to draft legislation in Montana. Should the state legislature fail to approve legislation creating the ISC, the Montana Department of Fish, Wildlife and Parks will administer funds. Indirect costs (5% of direct costs) associated with administration of the Plan are included in the budget for each task.

The proposed Plan and budget recommendations are submitted as a comprehensive approach to managing aquatic invasive species in Montana. While all of the actions identified in the Plan are important, the formation of the ISC and funding to support an ANS coordinator are critical to effective ANS management in Montana. The ANS coordinator could identify and seek additional funding to implement the many elements of the Plan. This model has proven effective in Washington State and is under development in Oregon.

Objectives/Actions		Implementing Organization	Funding (in thousands) and Personnel requests											
			FY 03						FY 04					
#	Description		State and other Funds		Federal Funds		Totals		State and other Funds		Federal Funds		Totals	
			Agency	$	Agency	$	$	FTE	Agency	$	Agency	$	$	FTE
Objective 1: Coordinate and implement a comprehensive management plan.														
Strategy 1A: Coordinate all ANS management programs and activities within Montana														
1A1	ISC Steering Committee	Gov/FWP/MDA			FWS	9	9		State	18			18	
1A2	ISC Coordinator	FWP/ISC			FWS	37.5	37.5	1	State		FWS	75	75	1
1A3	Support staff	FWP/MDA			FWS	15	15	1			FWS	30	30	1
1A4	Federal, tribal, private support	ISC & Coord				0	0					0	0	
1A5	ANS permit program	FWP				0	0					?		
1A6	ANS training	ISC & Coord				10	10					20	20	
1A7	Annual forum	ISC & Coord				0	0					30	30	
1A8	ANS strategy consistent	ISC & Coord			FWS	0	0				FWS	0	0	
1A9	ANS assessment guideline	ISC & Coord			FWS	0	0					5	5	
1A10	Assign priority class	ISC & Coord	See 1A2			0	0					5	5	
1A11	Develop definitions	ISC & Coord				0	0					0	0	
1A12	Rapid Response Plan	ISC & Coord			FWS	5	5				FWS	10	10	
Strategy 1B: Participate in and support regional, federal, and international efforts to control ANS.														
1B1	Western Regional Panel	ISC & Coord	See 1A2			0	0		See 1A2			0	0	
1B2	PSMFC coordination	ISC & Coord			BPA	0	0				BPA	0	0	
1B3	100th Meridian Project	ISC & Coord				5	5					5	5	
1B4	Interstate & Canadian coordination	ISC & Coord				0	0					0	0	
1B5	CRANSI	ISC & Coord			BPA	?	?				BPA	?	?	
Strategy 1C: Increase existing funding and resources for ANS management and establish new funding and resources.														

Agencies alphabetized by abbreviation: Animal & Plant Health Inspection Service (APHIS), Bureau of Reclamation (BOR), Department of Immigration and Naturalization Border Patrol (BP), Bonneville Power Administration (BPA), Corps of Engineers (COE), Coast Guard (CG), Columbia River Aquatic Nonindigenous Species Initiative (CRANSI), Montana Department of Commerce (DOC), Confederated Salish-Kootenai Tribe (CSKT), Montana Department of Environmental Quality (DEQ), Montana Department of Transportation (DOT), all federal agencies (Fed), USDA Forest Service (FS), Montana Department of Fish, Wildlife and Parks (FWP), U.S. Fish and Wildlife Service (FWS), Governor (Gov), Invasive Species Council and Coordinator (ISC & Coord), Montana Legislature (Leg), Montana Cooperative Extension Services (MCES), Montana Department of Agriculture (MDA), Montana Highway Patrol (MHP), Montana Native Plant Society (MNPS), Montana State University (MSU), National Park Service (NPS), Natural Resources Information Service (NRIS), private utility companies (Private), Pacific States Marine Fisheries Commission (PSMFC), all state agencies (state), University of Montana (UM).

Objectives/Actions		Implementing Organization	Funding (in thousands) and Personnel requests											
			FY 03						FY 04					
#	Description		State and other Funds		Federal Funds		Totals		State and other Funds		Federal Funds		Totals	
			Agency	$	Agency	$	$	FTE	Agency	$	Agency	$	$	FTE
1C1	Create stable funding	ISC & Coord				0	0					0	0	
1C2	Industry partnerships	ISC & Cood	See 1A1 & 1A2			0	0		See 1A1 and 1A2			0	0	
Strategy 1D: Review and evaluate state efforts in addressing ANS.														
1D1	Assess ANS presence	FWP/MDA			FWS	25	25				FWS	50	50	
1D2	ANS plan updates	ISC & Coord	See 1A1 and 1A2			0	0		See 1A1 and 1A2			0	0	
Objective 1: TOTALS						**$106.5**	**$106.5**	**2**		**18**		**$248**	**$266**	**2**
Objective 2: Prevent the introduction of ANS into Montana														
Strategy 2A: Research and address pathways of introduction														
2A1	Identify pathway / high risk waters	FWP/ MDA			FWS	15	15				FWS	30	30	
2A2	Inspection program	ISC & Coord				0	0					0	0	
2A3	Work with importers	ISC & Coord /FWP/ MDA/DOC/ APHIS	See 1A1 and 1A2			0	0		See 1A1 and 1A2			0	0	
2A4	Boat washing stations / coupons / tokens	ISC & Coord				5	5					5	5	
Strategy 2B: Increase enforcement and awareness of existing laws controlling the transport, propagation, sale, collection, possession, importation, purchase, cultivation, distribution, and introduction of ANS.														
2B1	ANS enforcement priority	FWP/MHP/MDA/ Co Weed Districts				0	0					0	0	
2B2	Train enforcement	FWP/MDA			FWS	5	5				FWS	10	10	

Agencies alphabetized by abbreviation: Animal & Plant Health Inspection Service (APHIS), Bureau of Reclamation (BOR), Department of Immigration and Naturalization Border Patrol (BP), Bonneville Power Administration (BPA), Corps of Engineers (COE), Coast Guard (CG), Columbia River Aquatic Nonindigenous Species Initiative (CRANSI), Montana Department of Commerce (DOC), Confederated Salish-Kootenai Tribe (CSKT), Montana Department of Environmental Quality (DEQ), Montana Department of Transportation (DOT), all federal agencies (Fed), USDA Forest Service (FS), Montana Department of Fish, Wildlife and Parks (FWP), U.S. Fish and Wildlife Service (FWS), Governor (Gov), Invasive Species Council and Coordinator (ISC & Coord), Montana Legislature (Leg), Montana Cooperative Extension Services (MCES), Montana Department of Agriculture (MDA), Montana Highway Patrol (MHP), Montana Native Plant Society (MNPS), Montana State University (MSU), National Park Service (NPS), Natural Resources Information Service (NRIS), private utility companies (Private), Pacific States Marine Fisheries Commission (PSMFC), all state agencies (state), University of Montana (UM).

Objectives/Actions		Implementing Organization	Funding (in thousands) and Personnel requests											
			FY 03						FY 04					
#	Description		State and other Funds		Federal Funds		Totals		State and other Funds		Federal Funds		Totals	
			Agency	$	Agency	$	$	FTE	Agency	$	Agency	$	$	FTE
	personnel													
2B3	Distribute information to importers	FWP/MDA			FWS	2	2				FWS	4	4	
2B4	Publicize penalties	FWP				2	2					2	2	
2B5	Examine regulations & penalties	FWP/MDA			FWS	0	0				FWS	0	0	
Strategy 2C: Prohibit, control, or permit the importation of nonindigenous aquatic species based upon their invasive potential.														
2C1	Research imported plants	FWP/MDA/APHIS			FWS	??	??				FWS	??	??	
Strategy 2D: Promote legislation and regulatory rules that establishes or increases the state's authority to control the introduction of new species.														
2D1	Authority to detain	Leg/Gov				0	0					0	0	
2D2	Regulate imports	Leg/Gov				0	0					0	0	
2D3	Authority to quarantine	Leg/Gov				0	0					0	0	
2D4	Imports to be pest free	FWP/MDA				0	0					0	0	
2D5	Cooperative agreement	Leg/Gov				0	0					0	0	
Objective 2: TOTALS						**$29**	**$29**					**$51**	**$51**	
Objective 3: Detect, monitor, and eradicate pioneering aquatic invasive species.														
Strategy 3A: Implement a surveillance and early detection program.														
3A1	Survey high-risk waters	FWP/ MDA			FWS	50	50				FWS	125	125	

Agencies alphabetized by abbreviation: Animal & Plant Health Inspection Service (APHIS), Bureau of Reclamation (BOR), Department of Immigration and Naturalization Border Patrol (BP), Bonneville Power Administration (BPA), Corps of Engineers (COE), Coast Guard (CG), Columbia River Aquatic Nonindigenous Species Initiative (CRANSI), Montana Department of Commerce (DOC), Confederated Salish-Kootenai Tribe (CSKT), Montana Department of Environmental Quality (DEQ), Montana Department of Transportation (DOT), all federal agencies (Fed), USDA Forest Service (FS), Montana Department of Fish, Wildlife and Parks (FWP), U.S. Fish and Wildlife Service (FWS), Governor (Gov), Invasive Species Council and Coordinator (ISC & Coord), Montana Legislature (Leg), Montana Cooperative Extension Services (MCES), Montana Department of Agriculture (MDA), Montana Highway Patrol (MHP), Montana Native Plant Society (MNPS), Montana State University (MSU), National Park Service (NPS), Natural Resources Information Service (NRIS), private utility companies (Private), Pacific States Marine Fisheries Commission (PSMFC), all state agencies (state), University of Montana (UM).

Objectives/Actions		Implementing Organization	Funding (in thousands) and Personnel requests											
			FY 03						FY 04					
#	Description		State and other Funds		Federal Funds		Totals		State and other Funds		Federal Funds		Totals	
			Agency	$	Agency	$	$	FTE	Agency	$	Agency	$	$	FTE
3A2	Citizen monitoring	ISC & Coord			FWS	5	5				FWS	10	10	
3A3	Zebra mussel monitors	FWP				0	0					0	0	
3A4	ANS monitoring	ISC & Coord				50	50					100	100	
3A5	Early detection surveys	UM/FWP/MSU				5	5					10	10	
Strategy 3B: Develop an early response mechanism to deal with detected and potential invasive species.														
3B1	Implement a rapid response plan	ISC & Coord/FWS			FWS	50	50				FWS	150	150	
3B2	Identify response fund	ISC & Coord			FWS	0	0				FWS	0	0	
Strategy 3C: Eradicate pioneering populations of ANS.														
3C1	Continue current eradication programs	MDA/Co Weed Districts/FWP				15	15					30	30	
Objective 3: TOTALS						**$175**	**$175**					**$425**	**$425**	
Objective 4: Where feasible, control and eradicate established ANS that have significant impacts.														
Strategy 4A: Limit the dispersal of established ANS to new waterbodies or to new areas of a waterbody.														
4A1	Boat washing stations	FWP/FS/BPA/BOR NPS/Tribes/COE				10	10					20	20	
4A2	Limit ANS disturbance	FWP/MDA				5	5					5	5	
4A3	Information signs	FWP/Fed/Tribes/ Private				5	5					5	5	
Strategy 4B: Eradicate or control known nuisance populations where economically and technically feasible.														

Agencies alphabetized by abbreviation: Animal & Plant Health Inspection Service (APHIS), Bureau of Reclamation (BOR), Department of Immigration and Naturalization Border Patrol (BP), Bonneville Power Administration (BPA), Corps of Engineers (COE), Coast Guard (CG), Columbia River Aquatic Nonindigenous Species Initiative (CRANSI), Montana Department of Commerce (DOC), Confederated Salish-Kootenai Tribe (CSKT), Montana Department of Environmental Quality (DEQ), Montana Department of Transportation (DOT), all federal agencies (Fed), USDA Forest Service (FS), Montana Department of Fish, Wildlife and Parks (FWP), U.S. Fish and Wildlife Service (FWS), Governor (Gov), Invasive Species Council and Coordinator (ISC & Coord), Montana Legislature (Leg), Montana Cooperative Extension Services (MCES), Montana Department of Agriculture (MDA), Montana Highway Patrol (MHP), Montana Native Plant Society (MNPS), Montana State University (MSU), National Park Service (NPS), Natural Resources Information Service (NRIS), private utility companies (Private), Pacific States Marine Fisheries Commission (PSMFC), all state agencies (state), University of Montana (UM).

Objectives/Actions		Implementing Organization	Funding (in thousands) and Personnel requests											
			FY 03						FY 04					
#	Description		State and other Funds		Federal Funds		Totals		State and other Funds		Federal Funds		Totals	
			Agency	$	Agency	$	$	FTE	Agency	$	Agency	$	$	FTE
4B1	Loosestrife biocontrol	FWP/MDA/CSKT			FWS	5	5				FWS	10	10	
4B2	Develop aquatic weed management plans	MDA/Co Weed Districts				5	5					5	5	
4B3	Technical assistance for local boards	FWP/MDA/Co Weed Districts				2	2					2	2	
4B4	Investigate new management strategies	FWP/MDA/MCES				0	0					0	0	
Objective 4: TOTALS						**$32**	**$32**					**$47**	**$47**	
Objective 5: Inform the public, policy makers, natural resource workers, private industry, and user groups about the risks and impacts of ANS.														
Strategy 5A: Educate the public about ANS, how their actions can prevent the spread and introduction of ANS and how they can help reduce the impacts of existing ANS.														
5A1	Incorporate ANS info into boat operator classes	FWP/CG				1	1					1	1	
5A2	Education curriculum	ISC & Coord				1	1					1	1	
5A3	Press releases, PSAs	ISC & Coord	see 1A2			0	0		see 1A2			0	0	
5A4	Articles, videos, web, billboards,TIS	ISC & Coord/ FWP				10	10					20	20	
5A5	Information at conferences	ISC & Coord/FWP/ MDA/Other Coop			FWS	10	10				FWS	15	15	
5A6	Info in hunting, fishing & boating regulations	FWP				0	0					0	0	
5A7	ANS id cards	ISC & Coord/FWP			FWS	15	15				FWS	15	15	
5A8	Develop a plant labeling system	MDA/MNPS				2	2					3	3	

Agencies alphabetized by abbreviation: Animal & Plant Health Inspection Service (APHIS), Bureau of Reclamation (BOR), Department of Immigration and Naturalization Border Patrol (BP), Bonneville Power Administration (BPA), Corps of Engineers (COE), Coast Guard (CG), Columbia River Aquatic Nonindigenous Species Initiative (CRANSI), Montana Department of Commerce (DOC), Confederated Salish-Kootenai Tribe (CSKT), Montana Department of Environmental Quality (DEQ), Montana Department of Transportation (DOT), all federal agencies (Fed), USDA Forest Service (FS), Montana Department of Fish, Wildlife and Parks (FWP), U.S. Fish and Wildlife Service (FWS), Governor (Gov), Invasive Species Council and Coordinator (ISC & Coord), Montana Legislature (Leg), Montana Cooperative Extension Services (MCES), Montana Department of Agriculture (MDA), Montana Highway Patrol (MHP), Montana Native Plant Society (MNPS), Montana State University (MSU), National Park Service (NPS), Natural Resources Information Service (NRIS), private utility companies (Private), Pacific States Marine Fisheries Commission (PSMFC), all state agencies (state), University of Montana (UM).

Objectives/Actions		Implementing Organization	Funding (in thousands) and Personnel requests											
			FY 03						FY 04					
#	Description		State and other Funds		Federal Funds		Totals		State and other Funds		Federal Funds		Totals	
			Agency	$	Agency	$	$	FTE	Agency	$	Agency	$	$	FTE
5A9	Inform policy makers about ANS	ISC/Cooperators				0	0					0	0	
5A10	Expand TIS	FWP/DOT/PSMFC				5	5					5	5	
5A11	aquatic ed. programs networks	Fed/state/private				0	0					0	0	
Strategy 5B: Train appropriate personnel in ANS identification.														
5B1	Identification seminars	ISC & Coord	IA6		FWS	0	0				FWS	0	0	
Strategy 5C: Educate private industry on the laws regulating and effects of ANS.														
5C1	Nursery pamphlet	ISC & Coord/MDA				5	5					5	5	
5C2	Information to retailers	ISC & Coord/FWP				5	5					5	5	
5C3	Fishing tournaments	ISC & Coord/FWP				5	5					5	5	
5C4	Id & information to others	ISC & Coord/FWP				5	5					5	5	
Objective 5:TOTALS						**$64**	**$64**					**$80**	**$80**	
Objective 6: Increase and disseminate knowledge of ANS in Montana through compiling data and conducting research.														
Strategy 6A: Research ANS species for their impact on biota utilizing regional efforts and literature searches.														
6A1	Biology and impacts	MSU/UM			FWS	50	50				FWS	75	75	
6A2	Vectors of fish disease	FWP/FWS			FWS	20	20				FWS	20	20	
6A3	Continue NZMS research	MSU				10	10					10	10	
6A4	Continue whirling disease research	FWP/MSU/UM/ FWS				20	20					20	20	

Agencies alphabetized by abbreviation: Animal & Plant Health Inspection Service (APHIS), Bureau of Reclamation (BOR), Department of Immigration and Naturalization Border Patrol (BP), Bonneville Power Administration (BPA), Corps of Engineers (COE), Coast Guard (CG), Columbia River Aquatic Nonindigenous Species Initiative (CRANSI), Montana Department of Commerce (DOC), Confederated Salish-Kootenai Tribe (CSKT), Montana Department of Environmental Quality (DEQ), Montana Department of Transportation (DOT), all federal agencies (Fed), USDA Forest Service (FS), Montana Department of Fish, Wildlife and Parks (FWP), U.S. Fish and Wildlife Service (FWS), Governor (Gov), Invasive Species Council and Coordinator (ISC & Coord), Montana Legislature (Leg), Montana Cooperative Extension Services (MCES), Montana Department of Agriculture (MDA), Montana Highway Patrol (MHP), Montana Native Plant Society (MNPS), Montana State University (MSU), National Park Service (NPS), Natural Resources Information Service (NRIS), private utility companies (Private), Pacific States Marine Fisheries Commission (PSMFC), all state agencies (state), University of Montana (UM).

Objectives/Actions		Implementing Organization	Funding (in thousands) and Personnel requests											
			FY 03						FY 04					
#	Description		State and other Funds		Federal Funds		Totals		State and other Funds		Federal Funds		Totals	
			Agency	$	Agency	$	$	FTE	Agency	$	Agency	$	$	FTE
Strategy 6B: Research management alternatives for their effect on ANS and native species.														
6B1	Investigate ANS/disturbed environment relationships	FWP/MSU/UM/Fed			FWS	5	5				FWS	5	5	
6B2	New management	MSU/UM/FWP			FWS	50	50				FWS	50	50	
6B3	Evaluate herbicide effects	MDA/MSU			FWS	5	5				FWS	5	5	
Strategy 6C: Facilitate the collection and dispersal of information, research, and data on ANS in Montana.														
6C1	Create central repository	NRIS			FWS	20	20				FWS	25	25	
6C2	Central database	PSMFC				1	1					1	1	
6C3	Build ANS website	NRIS/FWP/			FWS	25	25				FWS	25	25	
6C4	Use Existing personnel	FWP/Fed/Private	See 1A3			0	0		See 1A3			0	0	
6C5	Taxonomic experts	ISC & Coord	See 1A3			0	0		See 1A3			0	0	
Objective 6: TOTALS						**$206**	**$206**					**$236**	**$236**	

PLAN TOTALS:	FY03						FY04					
	State and other $		Federal $		Total $	Total FTE	State and other $		Federal $		Total $	Total FTE
				$612.5	$612.5	2		18		$1087	$1105	2

Agencies alphabetized by abbreviation: Animal & Plant Health Inspection Service (APHIS), Bureau of Reclamation (BOR), Department of Immigration and Naturalization Border Patrol (BP), Bonneville Power Administration (BPA), Corps of Engineers (COE), Coast Guard (CG), Columbia River Aquatic Nonindigenous Species Initiative (CRANSI), Montana Department of Commerce (DOC), Confederated Salish-Kootenai Tribe (CSKT), Montana Department of Environmental Quality (DEQ), Montana Department of Transportation (DOT), all federal agencies (Fed), USDA Forest Service (FS), Montana Department of Fish, Wildlife and Parks (FWP), U.S. Fish and Wildlife Service (FWS), Governor (Gov), Invasive Species Council and Coordinator (ISC & Coord), Montana Legislature (Leg), Montana Cooperative Extension Services (MCES), Montana Department of Agriculture (MDA), Montana Highway Patrol (MHP), Montana Native Plant Society (MNPS), Montana State University (MSU), National Park Service (NPS), Natural Resources Information Service (NRIS), private utility companies (Private), Pacific States Marine Fisheries Commission (PSMFC), all state agencies (state), University of Montana (UM).

PROGRAM MONITORING AND EVALUATION

The evaluation process of Montana ANS Management Plan will provide a means of monitoring progress, evaluating needs and problems, coordinating efforts and pursuing the goal of prevention and management of introductions, population growth, and dispersal of ANS into, within and from Montana. Mid-course corrections will be made when and if necessary. The process involves three main components: oversight, evaluation and reporting.

OVERSIGHT

A program oversight committee will be established. Consisting of interested parties identified during the review process, various Montana state and federal agencies, tribes and other interested private parties including members from the original steering committee who authored this document. The role of this interagency committee will be to examine progress on management actions focused on the goal of the state management plan. The committee can evaluate the success of each strategy by examining the level of achievement of the tasks clearly defined within each action.

EVALUATION

The evaluation effort should not only examine progress, but also place special emphasis on funding needs to successfully accomplish the goals and associated tasks. This information will prove useful for future program planning purposes. Evaluation should also incorporate information from those groups affected by plan implementation. These include people (organizations) involved with the responsibility of implementing management actions and resource user groups.

REPORTING

An annual progress report will be prepared and disseminated, highlighting the management actions regarding aquatic nuisance plants, animals and pathogens that year. This report will include information on the success in achieving the goals of prevention and maintenance of introductions, population growth, and ANS dispersal into, within and from Montana.

A program status report will be written every five (5) years that ties the annual progress reports to the overall ANS management plan, as well as future plans and directions. Successes, failures and new directions within Montana will be evaluated in comparison to and in concert with neighboring states, provinces and any regional planning efforts. The annual progress reports and the program status report (5 years) will be made available to the general public, local, state and federal decision makers.

GLOSSARY

Accidental introduction: an introduction of nonindigenous aquatic species that occurs as the result of activities other than the purposeful or intentional introduction of the species involved, such as the transport of nonindigenous species in ballast water or in water used to transport fish, mollusks, or crustaceans for aquaculture or other purposes.

Aquatic nuisance species: a plant or animal species that threatens the diversity or abundance of native species, the ecological stability of infested waters, or commercial, agricultural, aquacultural, or recreational activities dependent on such waters. (Note: for the purposes of the State management plans, reference to an aquatic nuisance species will imply that the species is nonindigenous.)

Biocontrol: The use of living organisms, such as predators, parasites, and pathogens, to control pest insects, weeds, or diseases.

Control: eradicating, suppressing, reducing, or managing invasive species populations, preventing spread of invasive species from areas where they are present, and taking steps such as restoration of native species and habitats to reduce the effects of invasive species and to prevent further invasions.

Ecological integrity: the extent to which an ecosystem has been altered by human behavior; an ecosystem with minimal impact from human activity has a high level of integrity; an ecosystem that has been substantially altered by human activity has a low level of integrity.

Eradicate: the act or process of eliminating an aquatic nuisance species.

Exotic: (same as nonindigenous) any species or other variable biological material that enters an ecosystem beyond its historic range, including such organisms transferred from one country to another.

Intentional introduction: all or part of the process by which a nonindigenous species is purposefully introduced into a new area.

Invasive: a species that takes over a new habitat where it was not previously found, often to the detriment of species which were there before.

Nonindigenous species: any species or other variable biological material that enters an ecosystem beyond its historic range, including such organisms transferred from one country to another.

Pathogen: a microbe or other organism that causes disease.

Pioneer infestation: a small ANS colony that has spread to a new area from an established colony.

Priority species: an ANS that is considered to be a significant threat to Montana waters and is recommended for immediate or continued management action to minimize or eliminate their impact.

Watershed: an entire drainage basin including all living and nonliving components.

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APPENDIX A

SECTION 1204 OF THE NATIONAL INVASIVE SPECIES ACT OF 1996

SEC. 1204. STATE AQUATIC NUISANCE SPECIES MANAGEMENT PLANS.

(a) STATE OR INTERSTATE INVASIVE SPECIES MANAGEMENT PLANS.—

(1) IN GENERAL -- After providing notice and opportunity for public comment, the Governor of each State may prepare and submit, or the Governors of the States and the governments of Indian Tribes involved in an interstate organization, may jointly prepare and submit—

(A) a comprehensive management plan to the Task Force for approval which identifies those areas or activities within the State or within the interstate region involved, other than those related to public facilities, for which technical, enforcement, or financial assistance (or any combination thereof) is needed to eliminate or reduce the environmental, public health, and safety risk associated with aquatic nuisance species, particularly the zebra mussel; and

(B) a public facility management plan to the Assistant Secretary for approval which is limited solely to identifying those public facilities within the State or within the interstate region involved for which technical and financial assistance is needed to reduce infestations of zebra mussels.

(2) CONTENT -- Each plan shall, to the extent possible, identify the management practices and measures that will be undertaken to reduce infestations of aquatic nuisance species. Each plan shall—

(A) identify and describe State and local programs for environmentally sound prevention and control of the target aquatic nuisance species;

(B) identify Federal activities that may be needed for environmentally sound prevention and control of aquatic nuisance species and a description of the manner in which those activities should be coordinated with State and local government activities;

(C) identify any authority that the State (or any State or Indian Tribe involved in the interstate organization) does not have at the time of the development of the plan that may be necessary for the State (or any State or Indian Tribe involved in the interstate organization) protect public health, property, and the environment from harm by aquatic nuisance species; and

(D) a schedule of implementing the plan, including a schedule of annual objectives, and enabling legislation.

(3) CONSULTATION —

(A)In developing and implementing a management plan, the State or interstate organization should, to the maximum extent practicable, involve local governments and regional entities, Indian Tribes, and public and private organizations that have expertise in the control of aquatic nuisance species.

(B) Upon the request of a State or the appropriate official of an interstate organization, the Task Force or the Assistant Secretary, as appropriate under paragraph (1), may provide technical assistance in developing and implementing a management plan.

(4) PLAN APPROVAL -- Within 90 days after the submission of a management plan, the Task Force or the Assistant Secretary in consultation with the Task Force, as appropriate under paragraph (1), shall review the proposed plan and approve it if it meets the requirements of this subsection or return the plan to the Governor or the interstate organization with recommended modifications.

(b) GRANT PROGRAM —

(1) STATE GRANTS -- The Director may, at the recommendation of the Task Force, make grants to States with management plans approved under subsection (a) for the implementation of those plans.

(2) APPLICATION -- An application for a grant under this subsection shall include an identification and description of the best management practices and measures which the State proposes to utilize in implementing an approved management plan with any Federal assistance to be provided under the grant.

(3) FEDERAL SHARE —

(A) The Federal share of the cost of each comprehensive management plan implemented with Federal assistance under this section in any fiscal year shall not exceed 75 percent of the cost incurred by the State in implementing such management program and the non–Federal share of such costs shall be provided from non–Federal sources.

(B) The Federal share of the cost of each public facility management plan implemented with Federal assistance under this section in any fiscal year shall not exceed 50 percent of the cost incurred by the State in implementing such management program and the non–Federal share of such costs shall be provided from non–Federal sources.

(4) ADMINISTRATIVE COSTS -- For the purposes of this section, administrative costs for activities and programs carried out with a grant in any fiscal year shall not exceed 5 percent of the amount of the grant in that year.

(5) IN–KIND CONTRIBUTIONS -- In addition to cash outlays and payments, in–kind contributions of property or personnel services by non–Federal interests for activities under this section may be used for the non–Federal share of the cost of those activities.

(c) ENFORCEMENT ASSISTANCE -- Upon request of a State or Indian Tribe, the Director or Under Secretary, to the extent allowable by law and in a manner consistent with section 141 of title 14, United States Code, may provide assistance to a State or Indian Tribe in enforcing an approved State or interstate invasive species management plan.

APPENDIX B

LIST OF NONINDIGENOUS SPECIES IN MONTANA

This is a list of nonindigenous species reported from waters of Montana (I). Included are species native to this state that have been introduced outside of their natural range (NI) based on George D. Holton, and Howard E. Johnson's research and 1996 book entitled, "A field Guide to Montana Fishes, Second Edition" published by Montana Fish, Wildlife & Parks, Helena, Montana. This list reflects established populations, single specimens, and eradicated populations. Also included are introductions that failed to persist. Listings identified to the genus level are included for their significance as unique or historical occurrences. This list is a work in progress.

Common name	Species name	Range
Montana Fishes		
Utah sucker	*Catostomus ardens*	I
rock bass	*Ambloplites rupestris*	I
green sunfish	*Lepomis cyanellus*	I
pumpkinseed sunfish	*Lepomis gibbosus*	I
bluegill	*Lepomis macrochirus*	I
smallmouth bass	*Micropterus dolomieu*	I
largemouth bass	*Micropterus salmoide*	I
white crappie	*Pomoxis annularis*	I
black crappie	*Pomoxis nigromaculatus*	I
pirapatinga	*Piaractus brachypomus*	I
Mozambique tilapia	*Oreochromis mossambicus*	I
goldfish	*Carassius auratus*	I
common carp	*Cyprinus carpio*	I
Utah chub	*Gila atraria*	I
golden shiner	*Notemigonus crysoleucas*	NI
spottail shiner	*Notropis hudsonius*	I
fathead minnow	*Pimephales promelas*	I
redside shiner	*Richardsonius balteatus*	NI
northern pike	*Esox lucius*	NI
tiger muskellunge	*Esox lucius x masquinongy*	I
plains killifish	*Fundulus zebrinus*	I
brook stickleback	*Culaea inconstans*	NI
black bullhead	*Ameiurus melas*	I
yellow bullhead	*Ameiurus natalis*	I
white bass	*Morone chrysops*	I
rainbow smelt	*Osmerus mordax*	I

yellow perch	*Perca flavescens*	I
walleye	*Stizostedion vitreum*	I
saugeye	*Stizostedion canadense x vitreum*	I
mosquitofish	*Gambusia affinis*	I
black molly	*Poecilia latipinna*	I
shortfin molly	*Poecilia mexicana*	I
guppy	*Poecilia reticulata*	I
Mexican molly	*Poecilia sphenops*	I
green swordtail	*Xiphophorus helleri*	I
southern platyfish	*Xiphophorus maculatus*	I
variable platyfish	*Xiphophorus variatus*	I
cisco	*Coregonus artedi*	I
lake whitefish	*Coregonus clupeaformis*	NI
golden trout	*Oncorhynchus aguabonita*	I
cutbow	*Oncorhynchus clarki x mykiss*	I
coho salmon	*Oncorhynchus kisutch*	I
rainbow trout	*Oncorhynchus mykiss*	NI
kokanee	*Oncorhynchus nerka kennerlyi*	I
chinook salmon	*Oncorhynchus tshawytscha*	I
Ohrid trout	*Salmo letnica*	I
landlocked Atlantic salmon	*Salmo salar Sebago*	I
brown trout	*Salmo trutta*	I
tiger trout	*Salmo truttax Salvelinus fontinalis*	I
brook trout	*Salvelinus fontinalis*	I
lake trout	*Salvelinus namaycush*	NI
Arctic grayling	*Thymallus arcticus*	NI
central mudminnow	*Umbra limi*	I

Crustaceans

opossum shrimp	*Mysis relicta*	I
freshwater shrimp	*Macrobrachium sp.*	I

Mollusks

mud bithynia	*Bithynia tentaculata*	I
New Zealand mudsnail	*Potamopyrgus antipodarum*	I
big-ear radix	*Radix auricularia*	I
red-rim melania	*Melanoides tuberculatus*	I

Aquatic Plants

water-cress	*Nasturtium officinale*	I
flowering rush	*Butomus umbellatus*	I
yellow iris	*Iris pseudacorus*	I
purple loosestrife	*Lythrum salicaria*	I

white water-lily	*Nymphaea odorata*	I
curly pondweed	*Potamogeton crispus*	I

Aquatic Mammals

Nutria	*Myocastor coypus*	I

APPENDIX C

ANS STEERING COMMITTEE, INCLUDING TECHNICAL COMMITTEE MEMBERS AND TECHNICAL ADVISORS

PROPOSED STEERING COMMITTEE

The ANS Technical Committee (*) has invited all of the major Montana land and water management agencies and organizations to participate in this management plan. However, for a variety of reasons not all of the invited participants have responded to this invitation. Those listed here as potential ANS Steering Committee Members *(in italics)*, have not responded to our invitation. We hope that they will participate in this effort. In some cases we have tentatively committed them to participate by listing them or their organization in the various strategies and Implementation Tables in the plan. In the event they elect not to participate in this plan they will be removed from these strategies, implementation tables and steering committee membership list in the final Montana ANS Management Plan.

Since most ANS will move across a neighboring state or a Canadian Province before reaching Montana, the neighboring states and provinces have also been invited to participate in this plan. They are listed and identified in the following Proposed Steering Committee as Interstate and Canadian Members. Their participation is also welcomed.

* = ANS Technical Committee (Writing Committee)
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APPENDIX D

PUBLIC COMMENTS

The Montana Aquatic Nuisance Species Management Plan will be available for public comment for a 60 day period which will end on August 30th, 2002. A press release will be issued to all local and regional news sources, followed by an email to all steering committee members that requested them to post information relating to the public comment period.

The public comments received will be included in this appendix. The response to the comments will be incorporated within each individual public comment.

APPENDIX E

FWP EXOTIC IMPORT LAWS, RULES AND POLICIES

MONTANA CODE ANNOTATED STATUTES

87-5-501. State policy. It is hereby declared to be the policy of the state of Montana that its fish and wildlife resources and particularly the fishing waters within the state are to be protected and preserved to the end that they be available for all time, without change, in their natural existing state except as may be necessary and appropriate after due consideration of all factors involved.

History: En. Sec. 1, Ch. 10, L. 1965; R.C.M. 1947, 26-1501.

87-1-301. ***(Temporary)*** **Powers of commission.** (1) The commission:

(a) shall set the policies for the protection, preservation, and propagation of the wildlife, fish, game, furbearers, waterfowl, nongame species, and endangered species of the state and for the fulfillment of all other responsibilities of the department as provided by law;

(b) shall establish the hunting, fishing, and trapping rules of the department;

(c) shall establish the rules of the department governing the use of lands owned or controlled by the department and waters under the jurisdiction of the department;

(d) must have the power within the department to establish wildlife refuges and bird and game preserves;

(e) shall approve all acquisitions or transfers by the department of interests in land or water;

(f) shall review and approve the budget of the department prior to its transmittal to the budget office; and

(g) shall review and approve construction projects that have an estimated cost of more than $1,000 but less than $5,000.

(2) The commission may adopt rules regarding the use and type of archery equipment that may be employed for hunting and fishing purposes, taking into account applicable standards as technical innovations in archery equipment change.

(3) The commission may adopt rules regarding the establishment of special licenses or permits, seasons, conditions, programs, or other provisions that the commission considers appropriate to promote or enhance hunting by Montana's youth and persons with disabilities.

(4) (a) The commission may adopt rules regarding nonresident big game combination licenses to:

(i) separate deer licenses from nonresident elk combination licenses;

(ii) set the fees for the separated deer combination licenses and the elk combination licenses without the deer tag;

(iii) condition the use of the deer licenses; and

(iv) limit the number of licenses sold.

(b) The commission may exercise the rulemaking authority in subsection (4)(a) when it is necessary and appropriate to regulate the harvest by nonresident big game combination license

holders for the biologically sound management of big game populations of deer and elk and to control the impacts of those deer and elk populations on uses of private property.

(5) The commission may adopt rules establishing license preference systems to distribute hunting licenses and permits:

(a) giving an applicant who has been unsuccessful for a longer period of time priority over an applicant who has been unsuccessful for a shorter period of time; and

(b) giving a qualifying landowner a preference in drawings. As used in this subsection (5)(b), "qualifying landowner" means the owner of land that provides some significant habitat benefit for wildlife, as determined by the commission.

(6) (a) The commission may adopt rules to:

(i) limit the number of nonresident mountain lion hunters in designated hunting districts in the administrative region designated by the department as region 1; and

(ii) determine the conditions under which nonresidents may hunt mountain lion in designated hunting districts in the administrative region designated by the department as region 1, which may include limiting the number of nonresident hound handler permits.

(b) The commission shall consider, but is not limited to consideration of, the following factors:

(i) harvest of lions by resident and nonresident hunters;

(ii) history of quota overruns;

(iii) composition, including age and sex, of the lion harvest;

(iv) historical outfitter use;

(v) conflicts among hunter groups;

(vi) availability of public and private lands; and

(vii) whether restrictions on nonresident hunters are more appropriate than restrictions on all hunters. *(Effective May 1, 2004)*

87-1-301. ***(Effective May 1, 2004)*** **. Powers of commission.** (1) The commission:

(a) shall set the policies for the protection, preservation, and propagation of the wildlife, fish, game, furbearers, waterfowl, nongame species, and endangered species of the state and for the fulfillment of all other responsibilities of the department as provided by law;

(b) shall establish the hunting, fishing, and trapping rules of the department;

(c) shall establish the rules of the department governing the use of lands owned or controlled by the department and waters under the jurisdiction of the department;

(d) must have the power within the department to establish wildlife refuges and bird and game preserves;

(e) shall approve all acquisitions or transfers by the department of interests in land or water;

(f) shall review and approve the budget of the department prior to its transmittal to the budget office; and

(g) shall review and approve construction projects whose estimated cost is more than $1,000 but less than $5,000.

(2) The commission may adopt rules regarding the use and type of archery equipment that may be employed for hunting and fishing purposes, taking into account applicable standards as technical innovations in archery equipment change.

(3) The commission may adopt rules regarding the establishment of special licenses or permits, seasons, conditions, programs, or other provisions that the commission considers appropriate to promote or enhance hunting by Montana's youth and persons with disabilities.

(4) (a) The commission may adopt rules regarding nonresident big game combination licenses to:

(i) separate deer licenses from nonresident elk combination licenses;

(ii) set the fees for the separated deer combination licenses and the elk combination licenses without the deer tag;

(iii) condition the use of the deer licenses; and

(iv) limit the number of licenses sold.

(b) The commission may exercise the rulemaking authority in subsection (4)(a) when it is necessary and appropriate to regulate the harvest by nonresident big game combination license holders for the biologically sound management of big game populations of deer and elk and to control the impacts of those deer and elk populations on uses of private property.

(5) The commission may adopt rules establishing license preference systems to distribute hunting licenses and permits:

(a) giving an applicant who has been unsuccessful for a longer period of time priority over an applicant who has been unsuccessful for a shorter period of time; and

(b) giving a qualifying landowner a preference in drawings. As used in this subsection (5)(b), "qualifying landowner" means the owner of land that provides some significant habitat benefit for wildlife, as determined by the commission.

History: En. 26-103.1 by Sec. 16, Ch. 417, L. 1977; R.C.M. 1947, 26-103.1; amd. Sec. 1, Ch. 22, L. 1991; amd. Sec. 1, Ch. 267, L. 1995; amd. Sec. 1, Ch. 355, L. 1997; amd. Sec. 1, Ch. 373, L. 1999; amd. Sec. 1, Ch. 533, L. 1999; amd. Sec. 1, Ch. 575, L. 2001.

87-3-105. Unlawful to import for introduction or to introduce or transplant wildlife. Except as provided in 87-5-703, it is unlawful for any person to import for introduction or to transplant or introduce any wildlife into the state of Montana unless done in accordance with the provisions of Title 87, chapter 5, part 7.

History: En. Sec. 3694.3, R.C.M. 1935 by Sec. 1, Ch. 100, L. 1949; amd. Sec. 1, Ch. 153, L. 1951; amd. Sec. 2, Ch. 113, L. 1975; amd. Sec. 37, Ch. 9, L. 1977; amd. Sec. 13, Ch. 417, L. 1977; R.C.M. 1947, 26-344(2); amd. Sec. 1, Ch. 624, L. 1985.

87-5-102. ***(Temporary)*** **Definitions.** As used in this part, the following definitions apply:

(1) "Account" means the nongame wildlife account established in 87-5-121.

(2) "Commercial purposes" means the collection, harvest, possession, or transportation of a species or subspecies of nongame wildlife from the wild with the intent to barter, offer for sale, ship or transport for eventual sale, or sell the animal or any part of the animal.

(3) "Ecosystem" means a system of living organisms and their environment, each influencing the existence of the other and both necessary for the maintenance of life.

(4) "Endangered species" means a species or subspecies of wildlife that is actively threatened with extinction due to any of the following factors:

(a) the destruction, drastic modification, or severe curtailment of its habitat;

(b) its overutilization for scientific, commercial, or sporting purposes;

(c) the effect on it of disease, pollution, or predation;

(d) other natural or artificial factors affecting its prospects of survival or recruitment within the state; or

(e) any combination of the foregoing factors.

(5) "Management" means the collection and application of biological information for the

purposes of conserving populations of wildlife consistent with other uses of land and habitat. The term includes the entire range of activities that constitute a modern scientific resource program, including but not limited to research, census, law enforcement, habitat improvement, control, and education. The term also includes the periodic protection of species or populations as well as regulated taking.

(6) "Nongame wildlife" means a wild mammal, bird, amphibian, reptile, fish, mollusk, crustacean, or other wild animal not otherwise legally classified by statute or regulation of this state. Animals designated by statute or regulation of this state as predatory in nature are not classified as nongame wildlife for purposes of this part. Prairie dogs are nongame wildlife and may be managed, controlled, and regulated under this part. Management and control by counties and the department of agriculture pursuant to Title 7, chapter 22, part 22 or 25, and Title 80, chapter 7, part 11, and control by the department of natural resources and conservation on state trust lands are permitted as long as the management and control are consistent with any management plan approved by the department, the department of natural resources and conservation, and the department of agriculture. Nothing in this part may be interpreted to limit a landowner's ability to control prairie dog concentrations on private lands.

(7) "Optimum carrying capacity" means that point at which a given habitat can support healthy populations of wildlife species, having regard to the total ecosystem, without diminishing the ability of the habitat to continue that function.

(8) "Person" means an individual, firm, corporation, association, or partnership.

(9) "Take" means to harass, hunt, capture, or kill or attempt to harass, hunt, capture, or kill wildlife.

(10) "Wildlife" means a wild mammal, bird, reptile, amphibian, fish, mollusk, crustacean, or other wild animal or any part, product, egg, or offspring or the dead body or parts of the animal. *(Effective October 1, 2007)*

87-5-104. Investigations by department. The department shall conduct investigations on nongame wildlife in order to develop information relating to population, distribution, habitat needs, limiting factors, and other biological and ecological data to determine management measures necessary for their continued ability to sustain themselves successfully. The department shall conduct ongoing investigations of nongame wildlife.

History: En. Sec. 4, Ch. 461, L. 1973; amd. Sec. 13, Ch. 417, L. 1977; R.C.M. 1947, 26-1804(part).

87-5-105. Regulations to manage nongame wildlife. (1) On the basis of the determinations made pursuant to 87-5-104, the department shall issue management regulations. The regulations must set forth species or subspecies of nongame wildlife that the department considers to be in need of management pursuant to 87-5-104 through 87-5-106, giving their common and scientific names by species and subspecies.

(2) The department shall by regulation establish limitations relating to taking, possession, transportation, exportation, processing, sale or offer for sale, or shipment considered necessary to manage nongame wildlife that is designated in need of management.

History: En. Sec. 4, Ch. 461, L. 1973; amd. Sec. 13, Ch. 417, L. 1977; R.C.M. 1947, 26-1804(part); amd. Sec. 7, Ch. 316, L. 2001.

87-5-116. Limited taking of certain nongame wildlife for commercial purposes -- exceptions. (1) The following nongame wildlife may not be taken for commercial purposes,

except as provided in subsections (3) and (4), without prior authorization of the department, subject to regulations adopted by the department:

(a) northern flying squirrel (Glaucomys sabrinus);

(b) pika (Ochotona princeps);

(c) pygmy rabbit (Brachylagus idahoensis);

(d) amphibians native to the state of Montana; and

(e) reptiles native to the state of Montana.

(2) The department may regulate the taking of nongame wildlife for commercial purposes. Regulations may establish limitations related to the taking, possession, transportation, exportation, processing, sale or offer for sale, and shipment of nongame wildlife that are considered necessary to manage nongame wildlife.

(3) The harvest of the prairie rattlesnake (Crotalus viridis) for commercial purposes may not be regulated under this section.

(4) This section does not prohibit:

(a) outfitting for the shooting of nongame wildlife;

(b) payment by a landowner to an individual for shooting or removing nongame wildlife; or

(c) the use of byproducts of nongame wildlife in fishing flies, jewelry, or other handicrafts.

History: En. Sec. 2, Ch. 301, L. 2001.

87-5-701. Purpose. The legislature finds that in order to protect the native wildlife and plant species of Montana and to protect the agricultural production of Montana, it is necessary to provide for the control of the importation for introduction and the transplantation or introduction of wildlife in the state. Serious threats, known and unknown, to the well-being of native wildlife and plant species and to agricultural production, resulting from the introduction of wildlife into natural habitats, necessitate the prohibition of the importation for introduction and the transplantation or introduction of wildlife into natural habitats unless it can be shown that no harm will result from such transplantation or introduction. Any importation for introduction or the transplantation or introduction permitted must be conducted in a manner to assure that the introduced or transplanted population can be controlled if harm arises from unforeseen effects.

History: En. Sec. 2, Ch. 624, L. 1985.

87-5-702. Definitions. For purposes of this part, the following definitions apply:

(1) "Feral" means the appearance in a natural habitat of an animal that has escaped domestication and become wild.

(2) "Importation" means the act of bringing into the state any wildlife.

(3) "Introduction" means the release of or attempt to release, intentional or otherwise, wildlife from outside the state into natural habitats of the state.

(4) "Natural habitat" means any area in which the introduction of wildlife species may result in an uncontrolled, naturally reproducing population of that species becoming established.

(5) "Transplantation" means the release of or attempt to release, intentional or otherwise, wildlife from one place within the state into natural habitats in another part of the state.

(6) "Wildlife" means any wild mammal, bird, reptile, amphibian, fish, mollusk, crustacean, or other wild animal or the egg or offspring thereof.

History: En. Sec. 3, Ch. 624, L. 1985.

87-5-703. Applicability to other provisions for importation or introduction of wildlife. Sections 87-5-701 through 87-5-704, 87-5-711, 87-5-713 through 87-5-716, and 87-5-721 do not apply to the importation of wildlife for the commercial pet trade or to the provisions on importation or introduction of wildlife contained in the following laws:

(1) Title 80;

(2) 87-3-207 and 87-3-208;

(3) 87-3-221 through 87-3-224 or 87-3-209, 87-3-210, and 87-3-225 through 87-3-227;

(4) 87-4-422;

(5) 87-5-112;

(6) 87-5-205;

(7) 87-5-302; or

(8) Title 81, chapter 2.

87-5-704. Rulemaking. (1) The commission may adopt rules to implement 87-5-701, 87-5-702, and 87-5-711 through 87-5-715. In implementing 87-5-713, the commission may adopt rules approving species of wildlife that may be introduced by the department. In implementing 87-5-715, the commission may adopt rules to authorize the control or extermination by the department of introduced wildlife species.

(2) The department may adopt rules to implement 87-5-713 and 87-5-715. In implementing 87-5-713 and 87-5-715, the department may not adopt rules in the subject areas reserved to the commission in subsection (1).

History: En. Sec. 10, Ch. 624, L. 1985.

87-5-711. Control of importation for introduction and transplantation or introduction of wildlife. (1) Except as otherwise provided, the importation for introduction or the transplantation or introduction of any wildlife is prohibited unless the commission determines, based upon scientific investigation and after public hearing, that a species of wildlife poses no threat of harm to native wildlife and plants or to agricultural production and that the transplantation or introduction of a species has significant public benefits.

(2) With regard to the transplantation or introduction of a fish species not previously legally transplanted to a specific water body within the state or not previously legally introduced to the state, the requirement for scientific investigation in subsection (1) may be satisfied only by completion of an environmental review conforming to the provisions of Title 75, chapter 1, part 2.

History: En. Sec. 4, Ch. 624, L. 1985; amd. Sec. 1, Ch. 501, L. 1991.

87-5-712. Authority for commission to control importation generally of certain wildlife species. The commission may, after public hearing, list by administrative rule wildlife species prohibited from importation for captive breeding for research or commercial purposes or for the commercial pet trade if the commission finds, based on scientific investigation, that the species, because of behavioral traits or other biological considerations, would not be readily subject to control by man while in captivity or that if released into natural habitat would pose a substantial threat to native wildlife and plants or agricultural production.

History: En. Sec. 7, Ch. 624, L. 1985.

87-5-713. Control of wildlife species permitted to be transplanted or introduced. Any wildlife species listed in 87-5-714 or approved by the commission for introduction or transplantation may be introduced or transplanted only subject to a plan developed by the department to assure that the population can be controlled if any unforeseen harm should occur.

History: En. Sec. 5, Ch. 624, L. 1985.

87-5-714. Wildlife species authorized for introduction or transplantation. (1) The following wildlife species may be introduced or transplanted by the department based upon scientific investigation and upon approval of the commission:

(a) gray (Hungarian) partridge (Perdix perdix);
(b) chukar partridge (Alectoris chukar);
(c) ring-necked pheasant (Phasianus colchicus);
(d) turkey (Meleagris gallopavo);
(e) rainbow trout (Salmo gairdneri);
(f) golden trout (Salmo aquabonita);
(g) brown trout (Salmo trutta);
(h) brook trout (Salvelinus fontinalis);
(i) lake trout (Salvelinus namaycush);
(j) northern pike (Esox lucius);
(k) black bullhead (Ictalurus melas);
(l) yellow bullhead (Ictalurus natalis);
(m) largemouth bass (Micropterus salmoides);
(n) smallmouth bass (Micropterus dolomieui);
(o) pumpkinseed sunfish (Lepomis gibbosus);
(p) bluegill (Lepomis macrochirus);
(q) green sunfish (Lepomis cyanellus);
(r) rock bass (Ambloplites rupestris);
(s) black crappie (Pomoxis nigromaculatus);
(t) white crappie (Pomoxis annularis);
(u) yellow perch (Perca flavescens);
(v) walleye (Stizostedion vitreum);
(w) cisco (tulibee) (Coregonus artedii);
(x) spottail shiner (Notropis hudsonius);
(y) kokanee salmon (Oncorhynchus nerka);
(z) chinook salmon (Oncorhynchus tshawytscha);
(aa) lake whitefish (Coregonus clupeaformis);
(bb) golden shiner (Notemigonus crysoleucas).

(2) The commission may by rule and subject to the provisions of 87-5-711 authorize the department to transplant or introduce species of wildlife not listed in subsection (1).

History: En. Sec. 9, Ch. 624, L. 1985.

87-5-715. Extermination or control of transplanted or introduced wildlife or feral species posing threat. Any wildlife or feral species transplanted or introduced in the state may be exterminated or controlled by the department if the commission determines that the species poses harm to native wildlife or plants or to agricultural production.

History: En. Sec. 6, Ch. 624, L. 1985; amd. Sec. 12, Ch. 376, L. 1989.

87-5-716. Consultation with the departments of agriculture and livestock. The commission and the department shall consult with the departments of agriculture and livestock in all matters relating to the control of wildlife species that may have a harmful effect on agricultural production or livestock operations in the state.

History: En. Sec. 8, Ch. 624, L. 1985.

87-5-721. Penalty -- license and permit revocation and denial. (1) Except as provided in subsection (2), a person who violates a provision of this part is guilty of a misdemeanor punishable as provided in 87-1-102, and the department, upon conviction of the person, shall revoke any license or permit issued by it under this title to the person and deny any application by the person for a license or permit under this title for a period not to exceed 2 years from the date of the conviction.

(2) A person who intentionally imports, introduces, or transplants fish in violation of this part:

(a) is guilty of an offense punishable by a fine of not less than $500 or more than $5,000 and imprisonment for up to 1 year. A sentencing court may consider an appropriate amount of community service in lieu of imprisonment. A sentencing court may not defer or suspend $500 of the fine amount.

(b) is civilly liable for the amount necessary to eliminate or mitigate the effects of the violation. The damages may be recovered on behalf of the public by the department or by the county attorney of the county in which the violation occurred, in a civil action in a court of competent jurisdiction. Money recovered by the department or a county attorney must be deposited in the state special revenue fund as provided in 87-1-601(1).

(c) upon conviction or forfeiture of bond or bail, shall forfeit from the date of conviction or forfeiture any current hunting, fishing, or trapping license issued under this title and the privilege to hunt, fish, or trap in this state for not less than 24 months. If the time necessary to eliminate or mitigate the effects of the violation exceeds 24 months, a person may be required to forfeit the privilege to hunt, fish, or trap in this state for more than 24 months. If the effects of the violation cannot be eliminated or mitigated, a person may be required to forfeit the privilege to hunt, fish, or trap in this state for the lifetime of that person.

History: En. Sec. 12, Ch. 624, L. 1985; amd. Sec. 2, Ch. 501, L. 1991; amd. Sec. 2, Ch. 223, L. 1993; amd. Sec. 1, Ch. 344, L. 1997.

12.7.701 AUTHORIZATION FOR DEPARTMENT AND COMMERCIAL FISH PLANTING

(1) The fish species on the following list and those listed in 87-5-714, MCA, may be introduced or transplanted by the department. This includes plants made by the U.S. fish and wildlife service fish hatcheries at the department's request, commercial hatchery stocking of licensed private and commercial ponds when approved by the department and commercial hatchery stocking of waters on private lands when approved by the department. List of fish species approved:

Common Name	Scientific Name
White sturgeon	Acipenser transmontanus
Pallid sturgeon	Scaphirhynchus albus
Shovelnose sturgeon	Scaphirhynchus platorynchus
Paddlefish	Polyodon spathula
Goldeye	Hiodon alosoides
Mountain whitefish	Prosopium williamsoni
Pygmy whitefish	Prosopium coulteri
Coho salmon	Oncorhynchus kisutch
Westslope cutthroat trout	Salmo clarki lewisi
Yellowstone cutthroat trout	Salmo clarki bouvieri
Atlantic salmon	Salmo salar
Bull trout	Salvelinus malma
Splake	Salvelinus fontinalis-Salvelinus namaycush hybrid
Arctic grayling	Thymallus arcticus
Pearl dace	Semotilus margarita
Creek chub	Semotilus atromaculatus
Northern redbelly dace	Phoxinus eos
Finescale dace	Phoxinus neogaeus
Flathead chub	Hybopsis gracilis
Sturgeon chub	Hybopsis gelida
Sicklefin chub	Hybopsis meeki
Lake chub	Couesius plumbeus
Emerald shiner	Notropis atherinoides
Sand shiner	Notropis stramineus
Brassy minnow	Hybognathus hankinsoni
Plains minnow	Hybognathus placitus
Western silvery minnow	Hesperoleucus symmetricus
Fathead minnow	Pimephales promelas
Longnose dace	Rhinichthys cataractae
Redside shiner	Richardsonius balteatus
Smallmouth buffalo	Ictiobus bubalus

Bigmouth buffalo	Ictiobus cyprinellus
Channel catfish	Ictalurus punctatus
Stonecat	Noturus flavus
Burbot	Lota lota
Plains killifish	Fundulus zebrinus
Mosquitofish	Gambusia affinis
Brook stickleback	Culaea inconstans
Sauger	Stizostedion canadense
Iowa darter	Etheostoma exile
Mottled sculpin	Cottus bairdi
Slimy sculpin	Cottus cognatus
Torrent sculpin	Cottus rhotheus
Shorthead sculpin	Cottus confusus
Spoonhead sculpin	Cottus ricei

(2) The commission concurs, in accordance with its authority under section 87-5-711, MCA, that the department's experiences with and studies of prior fish plantings and the requirements of the commission's rules on fish planting (ARM 12.7.601 and 12.7.602) constitute a scientific investigation required by section 87-5-714, MCA, and the plan required by section 87-5-713, MCA, for those species listed in section 87-5-714, MCA, or listed in subsection (1) of this rule. (History: Secs: 87-5-704, 87-5-711 MCA; IMP, Secs. 87-5-704, 87-5-711, 87-5-713, 87-5-714 MCA; NEW, 1986 MAR p. 949, Eff. 5/30/86.)

12.2.501 NONGAME WILDLIFE IN NEED OF MANAGEMENT (1) The following nongame wildlife species are determined by the department to be nongame wildlife in need of management within the meaning of the Nongame and Endangered Species Conservation Act, 87-5-101, MCA, et seq. Management regulations for these species will be issued annually by the department.

(a) Crayfish - Pacifasticus spp.
Orconectes spp.
(b) Freshwater mussels - all species of Pelecypoda
(c) Yellow Perch - Perca flavescens
(d) Crappie - Pomoxis.

(History: Sec. 87-5-105 MCA; IMP, Sec. 87-5-105 MCA; NEW, Eff. 9/4/75; AMD, 1977 MAR p. 946, Eff. 11/26/77; AMD, 1979 MAR p. 1388, Eff. 11/16/79; AMD, 1989 MAR p. 26, Eff. 1/13/89; EMERG, AMD, 1991 MAR p. 2032, Eff. 11/1/91; AMD, 1993 MAR p. 953, Eff. 5/14/93; TRANS, from ARM 12.5.301, Eff. 6/30/93; AMD, 1995 MAR p. 1571, Eff. 8/11/95.)

FISHERIES DIVISION POLICY

The purpose of this policy is to provide direction for Montana Fish, Wildlife & Parks' employees regarding **EXOTIC FISH AND NATIVE SPECIES MANAGEMENT**.

State statutes and administrative rule address the following:
(Reference: MCA 87-5-711; ARM 12.7.601-602) -- Effective 1970

The fish populations in Montana waters are combinations of native and introduced game or nongame species. They maintain themselves through natural reproduction with varying degrees of success. Fish produced through natural reproduction are classified as wild fish. Wild populations of game fish are supplemented with hatchery-reared fish in some waters (generally lakes and reservoirs) to provide additional recreational opportunity. Public interest varies among species but all are important and must be recognized in the management program.

Native fish include both game and nongame species, and all have intrinsic value as part of the state's native fauna. Therefore, it is the policy of this department to ensure the perpetuation of these fish. Priority will be given to native species in management decision.

The distribution of many native species has been reduced to a small portion of their original ranges. The management objective for these species will be to maintain their current abundance and distribution, and to expand their numbers and/or range where possible.

Non-native species (exotics) have been introduced into Montana waters for various reasons. Game species such as rainbow trout, brown trout and brook trout were introduced for sport fishing and have been successful and well accepted by the public. In spite of their popularity, they played a part in the decline of some native game species such as the cutthroat trout and Arctic grayling. Some introduced species have had a negative impact on many other aquatic species.

Because of the complex relationships among aquatic species and the probability of further damage to native species, an exotic fish will be introduced in a water or drainage only where it has a high potential for substantially improving sport fishing and practically no potential for reducing native game fish species.

To assure consistency and to meet procedural protocol, FWP will follow this policy.

Additional related FWP statutes include the following.

87-1-201 The department shall supervise all the fish of the state and to enforce the fish and game laws for protection, preservation and propagation of fish. The department may spend for the protection, preservation and propagation of fish.

87-1-301 The FWP Commission shall set the policies for the protection, preservation and propagation of fish, nongame species, and endangered species of the state.

CONTESTS / DERBIES

12.7.803 A fishing contest application will be evaluated based on (1) impacts on fish populations the aquatic ecosystem and the immediate area, (2) compatibility with fish management objectives for the water, (3) purse or participation limits (limits may or may not be imposed based on public comment), (4) conflicts with other contests proposed or approved, and (5) compliance with reporting requirements for previously sponsored events. FWP must provide an opportunity for public comment.

12.7.804 FWP must issue a decision within 90 days of receipt of an application. When FWP makes modifications to an application, the applicant must respond at least 10 days prior to the contest that the changes are acceptable or the application is considered withdrawn. An application may be denied for the following reasons: (1) it will have detrimental impacts on fish populations, the aquatic ecosystem or the surrounding area, (2) it would conflict with management goals, (3) it would conflict with other contests, or (4) it is proposed for a period of heavy recreational use on the host body of water, increasing the likelihood of conflicts with other users. FWP must notify the applicant and all persons submitting comment of its decision by mail.

DISEASE TESTING AND INSPECTION

87-3-225 Provides FWP authority to inspect fish hatcheries or culture facilities for the presence of pathogens.

87-3-226 Requires hatchery and culture facilities to report the presence of fish pathogens.

87-3-227 Assigns liability for damages resulting from diseases to the violator. Damages may be recovered by a person, firm, corporation or FWP.

HATCHERIES AND FISH EGGS

12.7.506 Disease inspection and quarantine procedures for hatcheries and culture facilities.

IMPORTATION / INTRODUCTION OF FISH

87-3-105 It is unlawful to import for introduction or to transplant or introduce any wildlife into Montana except in accordance with 87-5-701 through 721.

87-3-210 A FWP permit is required to import live non-salmonid fish or eggs except when intended for use in home or office aquarium. A permit is always required to import salmonids (87-3-221).

87-5-701 To protect native wildlife and plants, and agricultural production, the state shall prohibit the importation for introduction and the transplantation or introduction of wildlife in the state unless it can be shown that no harm will result. Any permit issued must ensure that the introduced or transplanted population can be controlled if harm arises from unforeseen effects. "Importation means the act of bringing into the state any wildlife. Introduction means the release of or attempt to release, intentional or otherwise, wildlife from outside the state into natural habitats of the state. Wildlife means any wild mammal, bird, reptile, amphibian, fish, mollusk, crustacean, or other wild animal or the egg or offspring thereof." This provision does not apply to the importation of wildlife for the pet trade.

87-5-703 Exempts the commercial pet trade from the provisions of importation restrictions unless the FWP Commission restricts the importation of a species.

87-5-711 Unless authorized by the FWP Commission, the importation for introduction or the transplantation or introduction of any wildlife is prohibited. MEPA review is required for the transplantation or introduction of any fish species not previously legally introduced to a specific body of water.

87-5-711 Fish and Wildlife - Wildlife Protection - Importation, Introduction, and Transplantation of Wildlife: Control of importation for introduction and transplantation or introduction of wildlife. (1) The importation for introduction or the transplantation or introduction of any wildlife is prohibited unless the commission determines, based upon scientific investigation and after public hearing, that a species of wildlife poses no threat of harm to native wildlife and plants or to agricultural production and that the transplantation or introduction of a species has significant public benefits. (2) With regard to the transplantation or introduction of a fish species not previously legally transplanted to a specific water body within the state or not previously legally introduced to the state, the requirement for scientific investigation in subsection (1) may be satisfied only by completion of an environmental review conforming to the provisions of Title 75, chapter 1, part 2

[Note there is no list of prohibited species in Montana Code]

87-5-712 After public hearing and based on scientific investigation, the FWP Commission may list by rule wildlife species prohibited from importation for captive breeding for research or commercial purposes or for the commercial pet trade. Scientific investigation must show that because of behavioral traits or other biological considerations, the species would not be readily subject to control by man while in captivity or that if released into natural habitat would pose a substantial threat to native wildlife and plants or agricultural production.

87-5-713 Any wildlife species approved for introduction or transplantation may only be introduced or transplanted subject to a plan developed by FWP to assure that the population can be controlled if necessary.

87-5-714 Lists the species that were approved by statute for introduction or transplantation by the department. Other species may be approved by the FWP Commission rule. Fishes listed include: rainbow trout, golden trout, brown trout, brook trout, lake trout, northern pike, black bullhead, yellow bullhead, largemouth bass, smallmouth bass, pumpkinseed sunfish, bluegill, green sunfish, rock bass, black crappie, white crappie, yellow perch, walleye, cisco, spottail shiner, kokanee salmon, chinook salmon, lake whitefish, golden shiner.

87-5-715 FWP and the Commission shall consult with the departments of Livestock and Agriculture in all matters relating to the control of wildlife that may have a harmful effect on agricultural production or livestock operations.

87-5-721 Violation of importation and introduction provisions is a misdemeanor and upon conviction will result in revocation of any license or permit issued under Title 87 for up to two years. A person who intentionally imports, introduces or transplants fish may be fined $500 to $5,000 and imprisoned for up to one year, and may be civilly liable for the amount necessary to eliminate or mitigate the damage.

12.7.502 Lists fish pathogens determined to pose a threat to fisheries.

12.7.505 Import permit process for fish.

12.7.701 Lists species of fish that may be introduced or transplanted by the department or with approval from the department. (See Fish Planting)

MONTANA ENVIRONMENTAL POLICY ACT

75-1-102 MEPA statutes.

12.2.428 MEPA Rules

NONGAME WILDLIFE

87-2-101 "Nongame wildlife" means any wild mammal, bird, amphibian, reptile, fish, mollusk, crustacean, or other animal not otherwise legally classified by statute or regulation.

87-5-104 FWP shall conduct ongoing investigations of nongame wildlife to determine management measures necessary.

87-5-105 Based on determination of management need, FWP shall issue management regulations that establish limitations related to taking, possession, transportation, exportation, processing, sale or offer for sale, or shipment.

87-5-106 It is unlawful to take, possess, transfer, sell, etc. any nongame wildlife deemed in need of management.

12.2.501 List of nongame wildlife in need of management: crayfish, freshwater mussels, yellow perch, crappie.

PRIVATE PONDS **(Also see: STOCKING and IMPORTATION/INTRODUCTION OF FISH)**

87-4-603 Specifies conditions for permitting private ponds and defines private ponds. The department may specify the species of fish that may be released in the pond and otherwise condition the license if there is a possibility of fish escaping from the pond into adjacent streams or lakes. The license holder may take fish from the pond in any manner.

RECREATION CONFLICT MANAGEMENT

87-1-303 The commission may adopt and enforce rules governing recreational uses of all public fishing reservoirs, public lakes, rivers, and streams that are legally accessible to the public. Rules must be adopted in the interest of public health, public safety, public welfare, and protection of private property and public resources in regulating swimming, hunting, fishing, trapping, boating, including but not limited to boating speed regulations, the operation of motor-driven boats, the operation of personal watercraft, the resolution of conflicts between users of motorized and non-motorized boats, water-skiing, surfboarding, picnicking, camping, sanitation, and use of firearms. Rules are subject to review and approval by department of public health and human services with regard to issues of public health and sanitation.

STOCKING FISH

12.7.601 **General policy for fish planting.** No state-raised fish shall be planted in waters of the state where public access for fishing is denied. Fish shall not be placed within ½ mile from portions of stream where public access is denied (unless there is state-owned access). Nonindigenous species to a particular drainage may only be introduced if study shows that it will be beneficial to the area. The species and size most economical in terms of fishing quality or creel return shall be used when possible. To plant a stream or lake with catchable-size trout (seven inches and longer) there must be an average increase of one fisherman day for each six fish planted, at least 40% of the planted fish must be creeled, and the average catch must be less than ½ fish per hour as determined by creel census (a directed warden creel census of at least 100 fishermen hours and at least 15 different anglers during the season will suffice). Periodic planting for resource management (population manipulation rather than immediate harvest) must measurably increase some segment of the fish population rather than replace wild fish, and must comprise a significant portion of the harvest.

12.7.602 **Stream planting policy.** Catchable-sized trout may be planted in streams only where they will not cause substantial environmental damage or reduce the pounds of game fish available for anglers. They may be planted only in streams that do not have a thriving wild trout population. In general, it is assumed that an annual plant of up to 1,000 catchable-sized trout per 10 miles of stream will not cause substantial damage. Such a plant may be continued if the regional fisheries manager determines that the stream has a less than thriving population and catchable-sized trout are needed. An established annual plant of 500 or fewer catchable-sized trout may be continued until it is determined that there is substantial damage or the return to creel

is unsatisfactory. Stream plants of catchable-sized trout may only be made between the end of spring high water and August 15 of each year. Exceptions may be made for unforseen conditions and for waters open year around.

12.7.701 Provides authorization for FWP and commercial fish planting (if approved by FWP) of specific fish species. Species approved for introduction or transplantation include: bigmouth buffalo, smallmouth buffalo, burbot, channel catfish, creek chub, Flathead chub, sturgeon chub, sicklefin chub, longnose dace, northern redbelly dace, finescale dace, pearl dace, lowa darter, goldeye, Arctic grayling, plains killifish, paddlefish, brassy minnow, plains minnow, western silvery minnow, fathead minnow, mosquitofish, Atlantic salmon, coho salmon, sauger, mottled sculpin, slimy sculpin, torrent sculpin, shorthead sculpin, spoonhead sculpin, emerald shiner, redside shiner, sand shiner, splake, brook stickleback, stonecat, white sturgeon, pallid sturgeon, shovelnose sturgeon, bull trout, westslope cutthroat trout, Yellowstone cutthroat trout, mountain whitefish, pygmy whitefish.

TRANSPORT OF LIVE OR DEAD FISH IN MONTANA

87-3-111 It is unlawful to purchase, sell, offer to sell, possess, ship, or transport any game fish or part thereof protected by the laws of this state except as specifically authorized by this state (through laws, rules, regulations, licenses, permits, etc.). **It is unlawful to transport live fish away from the body of water in which the fish were taken except for 1) licensed commercial seining operators, private commercial ponds, and permitted commercial aquatic fish food operators, 2) species approved by the Commission for use as live bait and subject to any restrictions imposed, and 3) within and along the boundaries of the Eastern Fishing District as established by the 1994-95 Commission regulations.**

87-3-209 It is unlawful to move live or dead salmonid fish or eggs from one location to another when they are know to be infected with fish pathogens that are identified by FWP as posing a threat to fisheries without written approval from FWP.

APPENDIX F

EXECUTIVE ORDER 13112

Executive Order 13112 of February 3, 1999

Invasive Species

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.), Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, as amended (16 U.S.C. 4701 et seq.), Lacey Act, as amended (18 U.S.C. 42), Federal Plant Pest Act (7 U.S.C. 150aa et seq.), Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 et seq.), Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), and other pertinent statutes, to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause, it is ordered as follows:

Section 1. *Definitions.*

(a)"Alien species" means, with respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem.

(b) "Control" means, as appropriate, eradicating, suppressing, reducing, or managing invasive species populations, preventing spread of invasive species from areas where they are present, and taking steps such as restoration of native species and habitats to reduce the effects of invasive species and to prevent further invasions. "

(c) "Ecosystem" means the complex of a community of organisms and its environment.

(d) (d) "Federal agency" means an executive department or agency, but does not include independent establishments as defined by 5 U.S.C. 104. (e) "Introduction" means the intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity.

(f) "Invasive species" means an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

(g) "Native species" means, with respect to a particular ecosystem, a species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem.

(h) "Species" means a group of organisms all of which have a high degree of physical and genetic similarity, generally interbreed only among themselves, and show persistent differences from members of allied groups of organisms.

(i) "Stakeholders" means, but is not limited to, State, tribal, and local government agencies, academic institutions, the scientific community, nongovernmental entities including environmental, agricultural, and conservation organizations, trade groups, commercial interests, and private landowners.

(j) "United States" means the 50 States, the District of Columbia, Puerto Rico, Guam, and all possessions, territories, and the territorial sea of the United States.

Sec. 2. *Federal Agency Duties.* (a) Each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law.

1) identify such actions;

2) subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them; and

3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

(b) Federal agencies shall pursue the duties set forth in this section in consultation with the Invasive Species Council, consistent with the Invasive Species Management Plan and in cooperation with stakeholders, as appropriate, and, as approved by the Department of State, when Federal agencies are working with international organizations and foreign nations.

Sec. 3. *Invasive Species Council.* (a) An Invasive Species Council (Council) is hereby established whose members shall include the Secretary of State, the Secretary of the Treasury, the Secretary of Defense, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Transportation, and the Administrator of the Environmental Protection Agency. The Council shall be Co-Chaired by the Secretary of the Interior, the Secretary of Agriculture, and the Secretary of Commerce. The Council may invite additional Federal agency representatives to be members, including representatives from subcabinet bureaus or offices with significant responsibilities concerning invasive species, and may prescribe special procedures for their participation. The Secretary of the Interior shall, with concurrence of the Co-Chairs, appoint an Executive Director of the Council and shall provide the staff and administrative support for the Council.

(b) The Secretary of the Interior shall establish an advisory committee under the Federal Advisory Committee Act, 5 U.S.C. App., to provide information and advice for consideration by the Council, and shall, after consultation with other members of the Council, appoint members of the advisory committee representing stakeholders. Among other things, the advisory committee shall recommend plans and actions at local, tribal, State, regional, and ecosystem-based levels to achieve the goals and objectives of the Management Plan in section 5 of this order. The advisory committee shall act in cooperation with stakeholders and existing organizations addressing invasive species. The Department of the Interior shall provide the administrative and financial support for the advisory committee.

Sec. 4. *Duties of the Invasive Species Council*. The Invasive Species Council shall provide national leadership regarding invasive species, and shall:

(a) oversee the implementation of this order and see that the Federal agency activities concerning invasive species are coordinated, complementary, cost-efficient, and effective, relying to the extent feasible and appropriate on existing organizations addressing invasive species, such as the Aquatic Nuisance Species Task Force, the Federal Interagency Committee for the Management of Noxious and Exotic Weeds, and the Committee on Environment and Natural Resources;

(b) encourage planning and action at local, tribal, State, regional, and ecosystem-based levels to achieve the goals and objectives of the Management Plan in section 5 of this order, in cooperation with stakeholders and existing organizations addressing invasive species;

(c) develop recommendations for international cooperation in addressing invasive species; develop, in consultation with the Council on Environmental Quality, guidance to Federal agencies pursuant to the National Environmental Policy Act on prevention and control of invasive species, including the procurement, use, and maintenance of native species as they affect invasive species;

(d) facilitate development of a coordinated network among Federal agencies to document, evaluate, and monitor impacts from invasive species on the economy, the environment, and human health;

(e) facilitate establishment of a coordinated, up-to-date information-sharing system that utilizes, to the greatest extent practicable, the Internet; this system shall facilitate access to and exchange of information concerning invasive species, including, but not limited to, information on distribution and abundance of invasive species; life histories of such species and invasive characteristics; economic, environmental, and human health impacts; management techniques, and laws and programs for management, research, and public education; and

(f) prepare and issue a national Invasive Species Management Plan asset forth in section 5 of this order.

Sec. 5. *Invasive Species Management Plan.* (a) Within 18 months after issuance of this order, the Council shall prepare and issue the first edition of a National Invasive Species Management Plan (Management Plan), which shall detail and recommend performance-oriented goals and objectives and specific measures of success for Federal agency efforts concerning invasive species. The Management Plan shall recommend specific objectives and measures for carrying out each of the Federal agency duties established in section 2

(a) of this order and shall set forth steps to be taken by the Council to carry out the duties assigned to it under section 4 of this order. The Management Plan shall be developed through a public process and in consultation with Federal agencies and stakeholders.

(b) The first edition of the Management Plan shall include a review of existing and prospective approaches and authorities for preventing the introduction and spread of invasive species, including those for identifying pathways by which invasive species are introduced and for minimizing the risk of introductions via those pathways, and shall identify research needs and recommend measures to minimize the risk that introductions will occur. Such recommended measures shall provide for a science-based process to evaluate risks associated

with introduction and spread of invasive species and a coordinated and systematic risk-based process to identify, monitor, and interdict pathways that may be involved in the introduction of invasive species. If recommended measures are not authorized by current law, the Council shall develop and recommend to the President through its Co-Chairs legislative proposals for necessary changes in authority.

(c) The Council shall update the Management Plan biennially and shall concurrently evaluate and report on success in achieving the goals and objectives set forth in the Management Plan. The Management Plan shall identify the personnel, other resources, and additional levels of coordination needed to achieve the Management Plan's identified goals and objectives, and the Council shall provide each edition of the Management Plan and each report on it to the Office of Management and Budget. Within 18 months after measures have been recommended by the Council in any edition of the Management Plan, each Federal agency whose action is required to implement such measures shall either take the action recommended or shall provide the Council with an explanation of why the action is not feasible. The Council shall assess the effectiveness of this order no less than once each 5 years after the order is issued and shall report to the Office of Management and Budget on whether the order should be revised.

Sec. 6. *Judicial Review and Administration.* (a) This order is intended only to improve the internal management of the executive branch and is not intended to create any right, benefit, or trust responsibility, substantive or procedural, enforceable at law or equity by a party against the United States, its agencies, its officers, or any other person.

(b) Executive Order 11987 of May 24, 1977, is hereby revoked.

(c) The requirements of this order do not affect the obligations of Federal agencies under 16 U.S.C. 4713 with respect to ballast water programs.

(d) The requirements of section 2(a)(3) of this order shall not apply to any action of the Department of State or Department of Defense if the Secretary of State or the Secretary of Defense finds that exemption from such requirements is necessary for foreign policy or national security reasons.

WILLIAM J. CLINTON

THE WHITE HOUSE,
February 3, 1999.

APPENDIX G

FEDERAL LAWS ADDRESSING AQUATIC NUISANCE SPECIES RELEVANT TO MONTANA

Department or Agency	Authority	Provisions	Organisms Addressed	Pathways or Means of Transport Addressed	Web Site
Dept. of Interior/FWS Dept. of Transportation/ Coast Guard EPA Dept. of Defense/Army Corps of Engineers Dept. of DOC/NOAA	National Invasive Species Act (1996)	Reauthorized and amended NANPCA to mandate regulations to prevent introduction and spread of aquatic nuisance species into Great Lakes through ballast water. Authorized funding for research on aquatic nuisance species prevention and control (Chesapeake Bay, Gulf of Mexico, Pacific Coast, Atlantic Coast, San Francisco Bay- Delta Estuary) Required ballast water management program to demonstrate technologies and practices to prevent nonindigenous species from being introduced	Aquatic nuisance species and brown tree snake	Unintentional introductions: ballast water	http://www.nemw.org/nisa.htm

Department or Agency	Authority	Provisions	Organisms Addressed	Pathways or Means of Transport Addressed	Web Site
		Modified composition of Aquatic Nuisance Species Task Force Required Task Force to develop and implement comprehensive program to control the brown tree snake in Guam			
Dept. of Interior/FWS Dept. of Transportation/ Coast Guard EPA Dept. of Defense/Army Corps of Engineers Dept. of DOC/NOAA	Nonindigenous Aquatic Nuisance Prevention and Control Act (1990)	Established Aquatic Nuisance Species Task Force to: identify areas where ballast water does not pose an environmental threat; assess whether aquatic nuisance species threaten the ecological characteristics and economic uses of US waters (other than the Great Lakes); determine the need for controls on vessels entering U.S. waters (other than Great Lakes); identify and evaluate approaches for reducing risk of adverse consequences associated with intentional introduction of aquatic species. Directs Coast Guard to issue regulations to prevent the introduction and spread of aquatic nuisance species into the Great Lakes through ballast water.	Aquatic nuisance species	Unintentional introductions: ballast water	http://www.anstaskforce.gov/toc.htm

Department or Agency	Authority	Provisions	Organisms Addressed	Pathways or Means of Transport Addressed	Web Site
		Directs Corps of Engineers to develop a program of research and technology to control zebra mussels in and around public facilities and make information available about control methods.			
	Alien Species Prevention and Enforcement Act (1992)	Makes the shipment of certain categories of plants and animals through U.S. mail illegal.	Plants and animals whose shipment is prohibited under 18 U.S.C. 42;43, or the Lacey Act Plants or plant matter whose shipment is prohibited under the Federal Plant Pest Act or Plant Protection Act	Intentional introductions: U.S. Mail	
Dept. of Agriculture/ APHIS	Plant Protection Act (2000)	Consolidates and modernizes several major statutes (Plant Quarantine Act, Federal Plant Pest Act, Federal Noxious Weed Act, Organic Act of 1944, and others), replacing them with one flexible statutory framework providing the ability to prohibit or restrict imports, exports, and	Plants and plant material Plant pests Noxious weeds Biological control agents	Unintentional and intentional introduction	

Department or Agency	Authority	Provisions	Organisms Addressed	Pathways or Means of Transport Addressed	Web Site
		interstate movement; assess higher civil penalties; issue subpoenas; conduct inspections without a warrant; cooperate with industry and others in "quality assurance" programs; recover costs related to disposal of abandoned shipments; and take emergency action. By expanding the definition of "noxious weed" the Act enables APHIS to address a broader range of weed problems.			
Federal land management agencies	Federal Noxious Weed Act of 1974	Although the Plant Protection Act superseded and repealed most of the Federal Noxious Weed Act, it left intact Section 15 (management of undesirable plants on Federal lands). Requires Federal land management agencies to develop and establish a management program for control of undesirable plants on Federal lands under the agencies' jurisdiction. Requires those agencies to coordinate management where similar programs are being implemented on State and private lands in the same area.	Noxious weeds Undesirable plant species	Control on Federal lands	http://refuges.fws.gov/FICMNEWFiles/FederalNoxiousWeedAct.html

Department or Agency	Authority	Provisions	Organisms Addressed	Pathways or Means of Transport Addressed	Web Site
Dept. of Agriculture/ APHIS	International Plant Protection Convention (1952)	Applies primarily to quarantine pests in international trade. Creates an international regime to prevent spread and introduction of plant and plant product pests premised on exchange of phytosanitary certificates between importing and exporting countries' national plant protection offices. Parties have national plant protection organizations established according to the Convention with authority in relation to quarantine control, risk analysis and other measures required to prevent the establishment and spread of all invasive alien species that, directly or indirectly, are pests of plants. Parties agree to cooperate on information exchange and on the development of International Standards for Phytosanitary Measures.	Pests of plants or plant products: "any form of plant or animal life, or any pathogenic agent, injurious or potentially injurious to plants or plant products" Quarantine pests involved with international trade: "pest of potential national economic importance to the country endangered thereby and not yet present there, or present but not widely distributed and being actively controlled"	"Storage places, conveyances, containers and any other object or material capable of harbouring or spreading plant pests, especially where international transportation is involved." Packing material or matter of any kind accompanying plant products Storage places Transportation facilities	http://www.fao.org/legal/treaties/004t-e.htm
Dept. of Interior	Lacey Act (1900; amended in 1998)	Prohibits import of a list of designated species and other vertebrates, mollusks, and	Species injurious to human beings or resources	Intentional introduction and trade	

Department or Agency	Authority	Provisions	Organisms Addressed	Pathways or Means of Transport Addressed	Web Site
		crustacea that are "injurious to human beings, to the interests of agriculture, horticulture, forestry, or to wildlife or the wildlife resources of the United States" Declares importation or transportation of any live wildlife as injurious and prohibited, except as provided for under the Act BUT Allows import of almost all species for scientific, medical, education, exhibition, or propagation purposes			
Dept. of Agriculture Dept. of Interior	Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) (1995)	A supplementary agreement to the World Trade Organization Agreement. Provides a uniform interpretation of the measures governing safety and plant and animal health regulations. Applicable to all sanitary and Phytosanitary measures directly or indirectly affecting international trade. Sanitary and Phytosanitary measures are defined as any measure applied a) to protect animal or plant life or health within (a Members' Territory) from entry,	Pests, diseases, disease-carrying organisms, or disease-causing organisms	Importation	http://www.wto.org/goods/spsagr.htm

Department or Agency	Authority	Provisions	Organisms Addressed	Pathways or Means of Transport Addressed	Web Site
		establishment or spread of pests, diseases, disease carrying organisms; e) to prevent or limit other damage within the (Members Territory) from the entry, establishment or spread of pests (annex A).			
Dept. of Defense	Convention on the prohibition of the development, production and stockpiling of bacteriological (biological) and toxin weapons and on their destruction (Biological Weapons Convention) (1975)	Article I prohibits parties from developing, producing, stockpiling, acquiring or retaining microbial or other biological agents which are not justified by exclusively peaceful purpose. Article II requires parties to destroy or divert to peaceful purpose all such agents within 9 months of entry into force of the Convention	"Microbial or other biological agents… whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes" Allows for "international exchange of bacteriological agents and toxins and equipment for the processing, use or production of	"Weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes"	http://sun00781.dn.net/nuke/control/bwc/text/bwc.htm

Department or Agency	Authority	Provisions	Organisms Addressed	Pathways or Means of Transport Addressed	Web Site
			bacteriological agents and toxins for peaceful purposes."		
Dept. of Agriculture/ APHIS	Act of March 2, 1931, often referred to as the Animal Damage Control Act	Gives APHIS authority to control wildlife damage on federal, state, or private land. Protects: field crops, vegetables, fruits, nuts, horticultural crops, commercial forests; freshwater aquaculture ponds and marine species cultivation areas; livestock on public and private range and in feedlots; public and private buildings and facilities; civilian and military aircraft; public health	Damaging species (nutria, blackbirds, European starlings, monk parakeets)	Unintentional introductions	
	North American Agreement on Environmental Cooperation (1994)	Article 10 (2)(h): the Council of the Commission on Environmental Co-operation may develop recommendations regarding exotic species which may be harmful	"Exotic" species: not specified further	Not specified	http://www.cec.org
EPA	Federal Insecticide, Fungicide, and Rodenticide Act	Gives EPA authority to regulate importation and distribution of substances, including organisms, that are intended to function as pesticides	Biological control agents (In terms of biological control agents,	Intentional introduction	http://www.epa.gov/pesticides/fifra.htm

Department or Agency	Authority	Provisions	Organisms Addressed	Pathways or Means of Transport Addressed	Web Site
			EPA currently regulates only eukaryotic and prokaryotic microorganisms under FIFRA. Other biocontrol agents are exempt because they are "adequately regulated" by another agency, I.E. USDA-APHIS)		
Dept. of Agriculture/ APHIS and AMS	Federal Seed Act (1939)	Requires accurate labeling and purity standards for seeds in commerce. Prohibits importation and movement of adulterated or misbranded seeds	Seeds	Intentional introduction through trade	
All	National Environmental Policy Act (1970)	Requires federal government agencies to consider the environmental effects of their actions through preparation of environmental impact statements (or environmental assessments to determine whether a full EIS is required). Effects of non-native species, if harmful to the	Non-native species posing harm to the environment	Intentional introductions related to major federal actions	http://es.epa.gov/oeca/ofa/nepa.html

Department or Agency	Authority	Provisions	Organisms Addressed	Pathways or Means of Transport Addressed	Web Site
		environment, must be included in the EIS			
Dept. of Interior	Convention on International Trade in Endangered Species (CITES) (1975)	Represents alternate model for regulating invasive species not already covered by the IPPC or other agreements. Convention intended to prevent harm in *exporting* country; however, can be applied when species is endangered in exporting country and considered an invasive in importing country.	Species of flora and fauna which are threatened or endangered in exporting countries (Appendices I, II and III-see web site)	Intentional introductions through trade: export, re-export, import and introduction from the sea	http://international.fws.gov/global/citestxt.html (For appendices, see: http://international.fws.gov/global/cites.html)
Dept. of Interior	Wild Bird Conservation Act (1992)	Regulates importation of foreign wild birds	Birds and non-native parasites and diseases transported by foreign birds	Importation	http://international.fws.gov/global/law102.html
Dept. of Interior/FWS Dept. of Commerce/ NMFS	Endangered Species Act	Protects endangered species When non-native invasive species threaten endangered species, this act could be used as basis for their eradication.	Non-native species posing a danger to local endangered species	Not specified	http://endangered.fws.gov/esa.html
All	Executive Order 13112 (Feb. 1999)	Defines invasive species ("any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem")	All	Unintentional and intentional introductions: escape, release	www.Invasivespecies.gov

Department or Agency	Authority	Provisions	Organisms Addressed	Pathways or Means of Transport Addressed	Web Site
		Directs all federal agencies to: -Address invasive species concerns; -Refrain from actions likely to increase invasive species problems. Creates interagency Invasive Species Council Calls for National Invasive Species Management Plan to better coordinate federal agency efforts.			

APPENDIX H

Western Governor's Association (WGA)
Policy Resolution 02-21

Undesirable Aquatic, Riparian, and Invasive Species

Annual Meeting
June 23, 2002
Phoenix, Arizona

SPONSOR: Governor Martz, Gutierrez, Knowles, Kempthorne, Geringer, and Owens

- **BACKGROUND**

1. Invasive or undesirable aquatic, riparian, and terrestrial species influence the productivity, value, and management of a broad range of land and water resources in the west. These undesirable species have significant negative economic, social and ecological impactswhich include, but are not limited to:
    a. reduction of yield and quality of desirable crop forage plants;
    b. poisoning of livestock;
    c. Reduction of native biodiversity resulting in a growing number of threatened, endangered and extinct species;
    d. adverse affects upon human health through allergies, poisoning, and harboring vectors;
    e. degradation of natural aquatic systems including obstruction of water flow in irrigation and drainage systems;
    f. reduction of the value of streams, lakes, reservoirs, oceans, and estuaries for fish and wildlife habitat, public water supply;
    g. high cost of control;
    h. increase in facilities maintenance costs such as power-plants, water treatment plants, etc.;
    i. detracting from the aesthetics and recreational value of wild lands, parklands, and other areas; and
    j. decreased real estate property value and increased costs of property development;
    k. competition with or transmission of diseases to wild Pacific salmon or other important marine and aquatic species.

2. Undesirable species are those listed on a state or federal recognized list of noxious, nuisance or deleterious species.

GOVERNORS - POLICY STATEMENT

1. The Western Governors recognize that the spread of invasive, undesirable species results from the combination of human behavior, susceptibility of invaded environments, and the biology of the invading species, and that these characteristics are not indicated by geopolitical boundaries, but rather by ecosystem-level components, which often span state borders. The Western Governors support coordinated, multi-state, management and eradication actions preventing the spread, intentional and unintentional introductions, and control of undesirable aquatic and terrestrial spaces on land and in the water. The principal objectives will be to maintain properly functioning natural systems, agricultural productivity, enhancing resource and environmental protection, and the protection of human health. Control programs will be those that are economically practicable in relationship to the long-term impacts an introduced nuisance species will cause.

2. In pursuit of these objectives, programs for the control and/or eradication of undesirable aquatic and terrestrial species need to incorporate education, prevention, and early detection and rapid response techniques and be based upon Integrated Pest Management (IPM) concepts and practices. IPM involves the use of all suitable techniques, including biological, chemical, physical (mechanical and manual), cultural measures (environmental manipulation), and public awareness programs.

3. The western governors strongly encourage all natural resource land management agencies, local governments, universities and the private sector to collaborate and form partnerships to prevent new introductions, for the enhancement, development and implementation of IPM programs, and to work together to find creative new approaches for protecting and restoring natural and agricultural resources, including the use of challenge grants.

4. The Western Governors urge full funding support for federal programs that manage invasive species on federal lands and provide assistants to states in the management of invasive species, including the national invasive species act and programs at the U.S. Department if Agricultural B Animal, Plant, and Health Inspection Service (APHIS) which provides valuable services in the detection and elimination of undesirable species of insects and plant diseases. Their services are essential for states relying on trade and export services to maintain strong trade and export functions.

GOVERNORS - MANAGEMENT DIRECTIVE

1. The Western Governors direct WGA staff to transmit this resolution to the appropriate cabinet secretaries and congressional committees.

2. The Western Governors Association shall obtain necessary resources and work with appropriate partners to facilitate the development and coordination of western strategies

to limit the spread of undesirable aquatic and terrestrial species. The executive director is authorized to obtain federal staff support under the Intergovernmental Personnel Act if necessary in connection with this directive.

3. Of particular importance will be:

   a. Development and harmonization of uniform, and scientifically based species lists;

   b. Establishing consistent and effective policies and procedures to prevent transport, sale and dispersal of undesirable species, particularly those under eradication in specific states;

   c. Development of uniform public educational and awareness media that create effective communication to the public throughout the western states; and

   d. Facilitation of development of appropriate K-12 school science curricula which recognizes that the introduction, spread and impacts of undesirable species prevent a serious environmental threat from a biological pollution@ and that engendering environmental stewardship is best accomplished with early education.

This resolution was originally adopted in 1998 as WGA policy resolution 98-018.

Approval of a WGA resolution requires an affirmative of two-thirds of the Board of Directors present at the meeting. Dissenting votes, if any, are indicated in the resolution. The Board of Directors is comprised of the governors of Alaska, American Samoa, Arizona, California, Colorado, Guam, Hawaii, Idaho, Kansas, Montana, Nevada, New Mexico, North Dakota, Northern Mariana Islands, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming.

All policy resolutions are posted on the WGA Web site (www.westgov.org) or you may request a copy by writing or calling:

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1515 Cleveland Place, Suite 200
Denver, CO 80202-5114
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APPENDIX I

RAPID RESPONSE PLAN

DRAFT #10 - RAPID RESPONSE PLAN

WESTERN REGIONAL PANEL ON AQUATIC NUISANCE SPECIES

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TEG/ZEBRA/RAPID RESPONSE PLAN OF WRP – VERSION #10

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PURPOSE

Rapid response is essential when a new organism is discovered in an area and it displays a high potential for developing into a nuisance species. This document presents examples of successful responses and others that struggled, it identifies factors that affect the probability of developing a successful response, and it identifies common problems that may preclude success. This plan also presents a model system, which functions at the state level through two organizations. The first organization is a state-wide council. Comprehensive statewide overview is essential to provide authority, establish priorities, and provide adequate funding. The second organization exists within a state Department and specializes in on-the-ground projects. Finally, this document provides appendices that will help the field biologist find some assistance in responding to a possible introduction.

Containment and eradication activities require focus and commitment, and they cannot proceed efficiently in an environment of complex demands and uncertain requirements. The goal of the model system is to create a consensus-driven decision process, but one where discussions about general strategies occur before the arrival of a new invader. The council makes the decision as to the general course of action when a nuisance species arrives. This decision provides the on-the-ground manager clear goals to obtain. Because each situation tends to include unique conditions related to the species and the environment, this plan is general in nature, and it does not attempt to address regional or national processes.

BACKGROUND AND RATIONALE

Aquatic nuisance species are organisms that create problems in and around the water. They may cause problems for people directly, such as weeds that interfere with boating. They may cause problems for the environment, such as weeds that overgrow a site and decrease oxygen in the water when they decay. Often they do both, such as northern pike that devour threatened native species as well as desirable game fish. While a native organism might occasionally cause problems, this plan addresses non-native species. A non-native species is one that has moved from its home range into areas where it never existed before. In most instances people are responsible for moving these species, either intentionally or accidentally.

Aquatic nuisance species can cause severe problems. Available solutions are often expensive and less than satisfactory. There are numerous examples, but a few will illustrate the scope of the problems. 1) Hydrilla is a water weed, and it can reduce the flow of water in a canal by 90 to 95 percent. In Florida, the hydrilla infestation increased from 50,000 acres in 1992 to 100,000 acres in 1994, despite the state's spending $6 million per year for its control. The estimated cost to adequately manage the infestation was about $11 million in 1992. By 1997 the cost increased to about $15 million. 2) Another water weed, water hyacinth, can cause the shutdown of power plants or pumps by blocking the water intakes. California spends about $1 million a year to control it in the Sacramento Delta, where only a couple thousand acres exist. 3) In the Great Lakes, zebra mussels caused the shutdown of power plants and other facilities that move water, and their sharp shells cut swimmers' feet and caused beach closures. The mussel also has suppressed native species, leading to a decrease in diversity. There is no method to control zebra

mussels over wide areas, although water and power utilities have implemented some procedures to help lessen its impacts on their operations. These methods are expensive and they do not eliminate the problem, so they must be employed on a ongoing basis. For example, in response to a poll, 23 nuclear power plants indicated that they spent an average of about $787,000 each on zebra mussel control between 1989 and 1995. 4) Beginning in 1999, mitten crabs swarmed into pumping stations that supply water to much of southern California. The station operators could not keep the crabs out of special pens that separate fish from the water flow so they are not forced through the huge pumps. In the pens, the moving water drove the fish against the hard, sharp shells of the crabs, killing many of them. These fish included several endangered species. The stations spent several hundred thousand dollars on equipment and alterations to keep the crabs out of the pens. The crabs have declined as a problem in the fish facilities in the last few years, partly due to the improvements made to the facility and changes in the way water flow is managed, and partly the population has declined after the very favorable year of 1999. Surveys show, however, the population has begun to increase again as the crab extends its range. As these examples demonstrate, aquatic nuisance species often cause problems that continue year after year.

Aquatic nuisance species can cause large and ongoing costs when they invade new locations, but those costs can be avoided if the species can be kept out of those new areas. This approach of avoiding problems is the general concept behind a variety of programs. It was first applied in public health with the old quarantine laws, and then in agriculture where it was given the name "Pest Prevention." Now the concept is being adopted to protect some natural resources as well.

Rapid response is one aspect of Pest Prevention, which is generally considered to have the following components: 1) keeping pests from entering an area through border inspections and control of traffic (officially termed "exclusion"); 2) searching to find any new infestations that get by the exclusion screen ("detection", which includes the ability to rapidly identify suspicious organisms); 3) **rapid response**; and 4) public awareness. Rapid response involves assessing the size of the infestation ("delimitation") relative to the resources and tools that are available to completely destroy or otherwise remove the infestation ("eradication"). Eradication is always the primary goal of rapid response. Anything less than eradication means that the pest, and the problems it may cause, are here to stay. In many cases, however, eradication may not be feasible. This is particularly true in aquatic systems where detection and control are difficult and pests may spread rapidly. Rapid response in these instances involves assessing which goals are attainable and most cost effective. The final response may have one of several possible goals, such as containing the problem entirely to a given area, or suppressing the population to slow its spread, or, in the worst case, learning to live with the problem.

LESSONS FROM RECENT RESPONSE EFFORTS

The three requirements for a successful eradication effort are: **A**ccess to the target organism, **P**ersistence of effort, and adequate **T**ools to control the populations. Any response will have a higher chance of success where these requirements are easier to meet. Conversely, in responses where these requirements are not adequately met, the chance of failure will be high. Many interdependent factors influence whether the requirements for a rapid response are met. Major ones include: funding and other resources, legal authority, will to act, regulatory hurdles,

interagency and public cooperation, experienced oversight, biology of the pest, available control methods, and size of the project.

Rapid response efforts are not new and lessons can be learned about the elements that lead to success or failure, by considering efforts that have proceeded relatively smoothly or not so smoothly. Two recent efforts that have captured attention are the response to a marine seaweed (*Caulerpa*) near San Diego, California, and the response to an aquatic fern (*Salvinia*) in the lower Colorado River near the border with Mexico. The two responses differed in their initial success but, as we shall see, they both followed much the same approach. Success differed due to differences in the size of the infestations and environmental complications, as well as variations in funding and perceptions of the seriousness of the threat relative to the costs of control. Neither response provides an optimal model. As an example of a different approach, we will also outline the response to hydrilla in California. California has a long history of defeating new invasions, but the approach may not be inclusive enough in today's political and environmental climate. The model system outlined at the end of this document addresses the weaknesses pointed out by the examples.

Caulerpa in Coastal Southern California

Caulerpa taxifolia is a saltwater alga -- a seaweed -- that is native to tropical waters, where it typically grows to small size and in limited patches. In the late 1970s the species became popular in the aquarium trade because it is fast-growing and decorative. The Stuttgart Aquarium in Germany selected a clone of the species that seemed promising, and they provided it to aquariums in France and Monaco. Around 1984 the clone apparently escaped from an aquarium into the Mediterranean, and it rapidly spread from a patch of about one square yard to over two acres by 1989. By 1997 it blanketed more than 11,000 acres of the northern Mediterranean coastline. Genetic analysis suggests that all *Caulerpa taxifolia* plants in the Mediterranean are clones of the original aquarium plant. In areas where the species becomes well established, it forms a dense carpet that overwhelms and eliminates native seaweeds, seagrasses, reefs, and other communities. In the Mediterranean, it harmed tourism and pleasure boating, devastated recreational diving, and has had a costly impact on commercial fishing by driving fish from the infested areas and by fouling fishing equipment. In a 1998 letter to Secretary of the Interior Bruce Babbitt, over 100 scientists and field biologists expressed their alarm about the damaging potential of this plant.

On June 12, 2000, a biologist from a marine consulting firm noticed an unusual seaweed in Aqua Hedionda Lagoon, in Carlsbad, California. Suspicious of the seaweed's identity, the firm sent a sample to a specialist who, on June 15, confirmed that it was identical in appearance with the invasive *Caulerpa*. This was the first find of *Caulerpa taxifolia* in North or South America. Although no one knows for certain, the *Caulerpa* may have been unintentionally released into the lagoon by someone dumping an aquarium, contamintated bait or other products derived from the sea.

Once the plant was identified, the firm contacted a variety of agencies that address invasive species, water, and wildlife issues, and discussions began about possible responses. Several different groups began researching control possibilities by June 22. More importantly, the

group immediately launched into action guided by their earliest discussions. The local power generator, which owns the lagoon, provided $123,000 to the effort. The consulting firm, under contract with the power generator, determined that the infestation consisted of about 0.5 acres of plants scattered over an area of about 5 acres. On June 28, 14 representatives from federal, state, and local agencies met and agreed to cooperatively develop a response. Biologists from the consulting firm began initial treatments by June 29. The selected treatment was to cover the patches with heavy tarps and pump in chlorine. By the end of June the group outlined an action plan that they released on July 12 as the Southern California Caulerpa Action Team (SCCAT) Rapid Response Program. By then, the infested area had been cordoned off and the local police and game wardens were helping enforce the closures. In addition, intensive public outreach efforts had been initiated.

In the ensuing weeks and months, SCCAT continued to focus on eradicating the population and reaching out to other interested groups. The local Regional Water Quality Control Board declared *Caulerpa* to be a pollutant. They took the lead on the governmental side and tapped their Pollutant Spill Emergency Fund to provide $700,000 for the effort. Two federal agencies contributed another $220,000. By September 18, all the known patches in the Lagoon had been treated.

In early August, another small infestation was found in Huntington Harbor, near Los Angeles. The Regional Water Quality Control Board in that area also obtained $700,000 from its emergency spill clean-up fund to control that population, and they initiated delimitation and treatment. Then SCCAT approached the California legislature and obtained another $950,000 for continuing research on control methods, outreach and education, and detection beyond the known infested areas.

The description of the response might give the impression that there was a strong central authority, with a clear strategy and unquestioned lines of command from the outset, but the original records show otherwise. The group had a diversity of opinions and agendas and it developed its strategies through a consensus approach. A different set of people spearheaded the different components of the response and they volunteered according to their abilities as much as being appointed by the group.

Although there was a diversity of opinions on many topics, the group was tied together by the conviction that eradication was the goal. There was a core of deeply concerned people who dedicated themselves to the response even though they had many other duties. They settled early on the most promising control strategies and they accepted that the treatment would damage other organisms under the tarps, although the tarps limited the extent of the effects. They identified one competent group to carry out the control operations and then everyone else helped pick up all the other necessary activities that surrounded the response, such as regulatory compliance, obtaining funding, interacting with other interested parties, and carrying out public outreach. In this manner, the control team was able to focus on the actual destruction of the pest without many distractions.

The response effort was fortunate in a number of ways. First, they were extremely fortunate to be able to identify and tap a very significant fund, over $900,000, to treat an infestation totaling

little more than one-half acre. By comparison, the California Department of Food and Agriculture (CDFA) has a budget of about $1.5 million per year for its eradication program on all its highest priority terrestrial weeds, occurring on over 800 sites covering over 7,000 acres. They were also very fortunate that the infestation was small and contained in a privately owned lagoon, so they could act without the difficulty of determining which agency had jurisdiction. Finally, they were fortunate in that no endangered species occurred in the lagoon and that some of the regulatory agencies embraced the threat and actively participated in the response.

Salvinia in the Lower Colorado River

Salvinia molesta is a small, Brazilian fern that floats upon the water. Unfortunately, its growth rate, ease of spread, and tendency to clump, more than make up for its small size. In favorable conditions a population will double in a week or less. For example, eight plants were set out one April in a ¼-acre spring-fed pond in Moselle, Mississippi. By six weeks later they had covered the water's surface. Mats of *Salvinia* commonly cover the water surface completely and the mats may reach up to three feet in thickness. These mats destroy native habitats in several ways. They compete with and shade out native vegetation, completely cutting light to the water. The mats prevent oxygen in the air from entering the water, and dying *Salvinia* drops to the bottom where it consumes the remaining dissolved oxygen as it decays. The most notable change in the landscape is the obliteration of open water, such that migrating birds may not recognize or stop at water bodies covered with *Salvinia.* Salvinia also directly affects people when it clogs water intakes, which interferes with irrigation, municipal water supplies, and electrical generation. The floating mats also provide excellent habitat for mosquitoes and anglers abandon once popular fishing spots because there is no open water to fish.

Despite all the problems it can cause, *Salvinia* is an attractive plant in small quantities. With the current interest in water gardens, it has sometimes entered the nursery trade and been offered for sale as an ornamental. In most cases where infestations have been found in public waterways, *Salvinia* has been offered for sale at nurseries in the state.

There already were well established infestations of *Salvinia* in Florida, Louisiana, and Texas, and the word was spreading about the seriousness of the potential problem, when, on August 4, 1999, a biologist for the US Fish and Wildlife Service (USFWS) noticed thousands of free-floating plants on the Colorado River as it passes through the Imperial National Wildlife Refuge, about 25 miles north of the Mexican border. The plants were quickly confirmed as *Salvinia.* On August 20, over fifty agency representatives and other interested people attended a meeting to consider the situation and plan a course of action. The USFWS was identified as the lead agency for the project. The group decided to quickly and cooperatively expand the search for the plant, and they completed the delimitation survey by September 15, when a second planning meeting occurred. The survey showed that the plants were scattered along 35 miles of the main river channel, 25 miles of the "old" river channel, and about 26 miles of a drainage ditch coming from the northwest near the vicinity of Blythe. The ditch was clearly the headwaters of the infestation. The infested area included two federal wildlife refuges and habitat of two endangered fish and two endangered birds. One of the birds, the Yuma clapper rail, regularly uses emergent vegetation such as bulrushes and cattails.

At the second meeting the group established a Task Force and encouraged all land managers in the infested area to undertake "...whatever actions they could to control *Salvinia* within existing and pertinent regulatory constraints", while the Task Force began development of an Action Plan. CDFA agreed to begin treatments in the ditch. By October 13, the group had prepared a "program plan" that discussed the issues related to the infestation, control options, and factors affecting the selection of controls. The group intended the program plan to lay the foundation for the Action Plan, along with recommendations from a Science/Management Advisory Panel. The Panel consisted of five experts in aquatic plants and their control from across the US. They visited the infestation on October 13 and 14, and recommended in their November 1 report that the response be "...a comprehensive, integrated and aggressive control program whose objectives are…to **eliminate** (their emphasis) populations in the River and all waters of the Western states".

Momentum for an all-out eradication program failed to materialize. Serious environmental concerns created a difficult situation, because two wildlife refuges, four endangered species, and a major water supply all required special consideration. Although the U.S. Fish and Wildlife Service took on the role of lead agency for the response, a variety of agencies have jurisdictions along the River, and there was no consensus about an overall approach to treatment throughout the infestation. The institutions that became involved all had difficulty finding funds and, as a result, the resources were not sufficient to provide a dedicated project manager, other staff, and necessary support. Everyone involved tried to participate in the response in addition to all their normal duties. Part of the difficulty for the federal agencies was that any use of their funds for herbicide treatments would likely trigger the need for an Environmental Impact Statement, with the attendant delays. Another factor was that biological control holds out hope for a less painful option. In some parts of the world a Brazilian weevil, highly specialized for feeding on *Salvinia*, has provided very effective control. In addition, for some unclear reason, but probably related to water chemistry, *Salvinia* has not thrived in the Colorado River itself, although it does well in the ditch. These latter two factors made the situation appear less threatening, reducing the incentive to eradicate.

The consensus of the group was to eradicate the infestation in the ditch by mechanically removing obstructions from the banks and treating the *Salvinia* with herbicides. Public outreach will also continue to be a priority. Once the infestation in the ditch is eradicated, the group hopes that the population in the river will lessen, but the next steps are unclear. No action plan has been produced, although a draft was circulating as of March 2001 and the hope was to finish it during the summer.

A SUMMARY OF THE RESPONSE TO CAULERPA AND SALVINIA

The approach used in the two responses was very similar. Someone found an infestation because of heightened public awareness and they sent a sample to an expert. Once the problem was confirmed, different agencies and local groups that might be affected or assist in the response were contacted. Representatives of the interested parties met to consider the situation. Delimitation proceeded quickly while the control options were quickly reviewed with input from expert biologists and managers. At this point, the two responses diverged radically, although the potential threat from both species was extremely high. The difference in response was not due to the approach, but because of differences between the groups themselves and in the difficulty of

the situations facing them. No mechanism was available to resolve those difficulties promptly and definitively.

Hydrilla in California

Hydrilla is a submerged water plant, native to the warmer areas of Asia. Its growth habit allows it to compete effectively for sunlight, and it will establish in an area and crowd out native aquatic plants. Hydrilla is very efficient at reproducing and maintaining itself, even during adverse conditions. For example, if a stem fragment has even a single whorl of leaves, almost 50% of the time it can sprout a new plant and each plant can produce a new population.

Hydrilla causes major impacts on water use. In drainage canals it greatly reduces flow which can result in flood damage. In irrigation canals it cuts water delivery and clogs pumps. Hydrilla can severely interfere with boating and swimming and it can adversely impact fish populations. For instance, largemouth bass begin to suffer when hydrilla covers more than 30% of a water body. The economic impacts to real estate values, tourism, and user groups can be staggering. For example, an economic study on Orange Lake in North Central Florida showed that the economic activity generated by the lake was almost $11.0 million per year. In years when hydrilla completely covered the lake, these benefits were almost completely lost. Cost of hydrilla management is also extremely high, as was described in the introduction.

Hydrilla has been discovered in California a number of times. California law declares hydrilla a noxious weed and charges the director of CDFA to "...immediately investigate the feasibility of eradication. If eradication is feasible, the director shall perform the eradication...taking those steps and actions the director deems necessary" (California Food and Agriculture Code 6048 and 6049). To date, the agency's response to hydrilla has been aggressive and persistent, with good success.

For example, hydrilla was discovered in the irrigation system of the Imperial Valley in 1977. CDFA initiated chemical and mechanical treatments in cooperation with the county and the Imperial Irrigation District, and they initiated a research program on other treatment methods in cooperation with a number of state and federal agencies, including the University of California. Despite the initial treatments, by 1988 over 600 miles of canals were infested and flow in some was reduced 90-95%. The method that led to the collapse of the infestation was when they were able to introduce sterile triploid grass carp into the system, after their research program satisfied the Department of Fish and Game that the fish were sterile and would not become a problem themselves. Stocking began in 1988 and by about 1998 the program had reduced the population to a handful of plants each year in isolated canals and drains. The stocking and survey system continues today, to suppress any remnants of the infestation and to provide general weed control.

In another large infestation, 26 miles of the Chowchilla River and the upstream end of Eastman Lake were found infested in 1989. Over 100,000 visitors used the lake each year, but CDFA quarantined and closed the lake, lowered the water level, and treated the infested lake bottom with Vapam, a soil fumigant. After follow-up treatments with aquatic herbicides, the lake was re-opened to visitors in 1992. As for the river, fortunately it runs low much of the year, which allowed effective treatment of the infestation. With chemical treatments, digging, and dredging,

the population of plants in the river was reduced to 6500 in 1993, to less than 50 in 1998, and five in 2001. Eradication work continues, mostly depending upon physical removal of the plants by hand pulling and dredging.

In still other, smaller infestations, CDFA has gone so far as to fill in ponds. For example, in 1985 hydrilla appeared in a series of ponds within a few hundred feet of the Sacramento River in the Redding area. This infestation presented such an extreme threat to the state that the Governor's office declared it an emergency. CDFA buried three small infested ponds inside the levees during the course of that eradication program.

CDFA does not always take such complete control of a water body. The most troublesome infestation in California has been the one in Clear Lake, a shallow, warm, murky, natural lake of about 43,000 acres about 60 miles north of the Bay Area. The shore of the lake is heavily developed and lake-related recreation is a major source of income for the area. Hydrilla was discovered in the lake in 1994 but CDFA did not quarantine the lake, to avoid the economic disruption it would create. CDFA crews surveyed and marked off the infested locations and began a public awareness program to prevent the spread of the weed, as well as initiating regular treatments with copper, and later with fluridone when it became available. The number of plants has been greatly suppressed but small new infested sites continue to appear at the rate of one or three per year, probably as a result of fragments from already infested sites. With the persistent effort, however, the hydrilla has begun to disappear from many of the previously infested sites, and eradication appears to be within grasp.

The responses to hydrilla have been successful for a number of reasons. California law gives CDFA a clear mandate and they make the eradication of hydrilla a top priority. They dedicate a crew to major infestations and even in small infestations a knowledgeable biologist will guide the work. They will use all available control methods and they support work to develop new ones. They are persistent, they cooperate with anyone interested in helping with an eradication campaign, and, in general, they have received good support from the community. The law that gave them their authority provided few funds, but they have always been provided adequate funding, though it sometimes comes from a variety of sources. Nonetheless, the program faces the same kinds of problems that beset many agencies. For instance, much of their funding sunsets in the next few years and they must begin the process of renewing those resources. Similarly, in the last several years the agency has felt more pressure from environmental hurdles and the costs they may bring.

ELEMENTS INFLUENCING SUCCESS OR FAILURE OF A RESPONSE

The above examples illustrate some of the elements that influence the success or failure of a response. Other elements may be found in other analyses of rapid response. For example, the excellent document, "A Rapid Response Toolbox: Strategies for the Control of ABWMAC Listed Species and Related Taxa in Australia" (The Toolbox), could serve as a model for general planning for rapid response, although it is specific to marine organisms. This document may be found at: www.marine.csiro.au/CRIMP/reports /Toolbox.pdf . The Toolbox goes beyond

the scope of the present document by outlining possible controls for a wide array of taxonomic groups but, in its introduction, the authors analyze several other recent responses to invasive species, including the eradication of *Mytilopsis sallei*, a relative of the zebra mussel, from three isolated marinas. They explore the factors that influence the decision to eradicate and the factors that affect success once the decision is made.

Influences on Success

Once the numbers of pests expand beyond the level where they can be individually removed, one of the main problems for eradication is a lack of highly specific control techniques. Optimally, a control method should be highly selective for the target pest, cost-effective, easy to use, and have no long-term negative effects on the environment or non-target species. Highly specific controls usually require detailed knowledge of the particular physiology, habitats and/or ecology of the target pest. Such knowledge is rarely available for an invader, even for the most widely recognized problem species. However, eradication technologies need not be as specific if their impacts on non-target species can be minimized in some way, such as when they are limited to a restricted area, or have transitory effects that allow recovery.

The authors of the Toolbox state that an eradication requires: early detection; a supportive legal framework; a capacity to act (requiring suitable funding and local/national support); an ability to quarantine the infested area if necessary; and the tools to eradicate the isolated population. In the successful eradication of the zebra mussel relative, other factors that contributed to the success included: rapid initiation of control efforts; legal capacity to enter, modify, or eliminate infested property; small water bodies isolated from the local marine environment; ability to track exposed vessels; and pre-existing information on chemical treatments for related taxa.

Interestingly, at the time the Toolbox was written, the authors believed that the *Caulerpa* response in San Diego was likely to fail, citing little pre-existing knowledge on control of the species, no clear lines of authority, no ready source of funding, and a lack of appropriate permits, all of which were true. Only by good cooperation and hard work were these problems avoided. Progress could still be in jeopardy if cooperation and focus break down among the many parties in the group, most of whom have a full range of duties to perform outside the response.

The Decision to Eradicate

In making the decision to eradicate, the authors of the Toolbox note that, with current available control methods, eradication is generally feasible only for small populations. Such populations generally represent an early stage in the invasion of a new area by a non-native species. An eradication program occurs in an environment of diverse laws and regulations, where private and public organizations, government agencies, industry, interest groups, and private individuals all interact. These interdependent groups often have differing interests. The limits of what can be achieved in an eradication program are set by available technology, and often some groups create the demand for a treatment technology while others oppose its use. Further, there is rarely time to gather enough information to accurately and objectively estimate the costs and benefits of a particular eradication attempt, particularly if there is no history with the target species. The decision to attempt eradication of a non-native pest can be difficult, as it may require balancing

conflicting social, political, and legal issues in a situation where good information is likely to be scarce. A number of factors influence the decision.

Factors to consider when deciding to eradicate:

A. Is there knowledge of the risk of reintroduction, and is the risk low enough to justify eradication?

B. Taken overall, can controls be initiated rapidly?

1. Was the invasion detected early? That is, the infestation is small and there are only a few locations?
2. Was the invader rapidly and accurately identified?
3. Is information on species biology and management quickly available?
4. Are treatment methods available?
5. Are there serious environmental issues or regulatory hurdles that will lead to delays or greatly increase the cost of treatment?
6. If permits are needed, can they be obtained in a timely fashion?
7. Has the species been prioritized for response and is there a pre-existing action plan?

C. Taken overall, is there a will to act?

1. Are there decision-making procedures and structures with the power to determine whether eradication should proceed, how, and who should fund it?
2. Has there been a clear assessment of technical, field, administrative, funding, and legal resources available for an eradication campaign?
3. Is there acceptance of the need to proceed on the best information available?
4. Is there acceptance of short-term, local impacts in return for long-term, wide-area benefits?
5. Is there acceptance that the "no action" response has serious impacts and is a poor option?
6. Do a preponderance of the agencies (and their staff) feel they have a clear responsibility to act, or does one agency have a clear mandate and authority to act?
7. Is there recognition and acceptance that the eradication effort can be a long term effort, almost always taking years in the case of plants or other organisms with resistant resting stages?

D. Taken overall, is organization adequate?

1. Is there an ability to quarantine the infested area?
2. Is there a capacity to survey, to determine whether the pest is restricted to the quarantine area?
3. Will program staff with experience in pest management and eradication be assigned to direct the control efforts and monitor results?
4. Are funding sources adequate and of sufficient duration?
5. Is there effective collaboration among the parties carrying out the effort?
6. Is there regional collaboration where infestations cross jurisdictions?
7. Are there provisions for monitoring in order to modify, expand, or end an eradication campaign?

E. Other factors

1. Is there support for the effort by affected parties, including the public?

2. Is there effective outreach and education for both the public and government decision makers?

Clearly, many of these factors are related but they all bear on ready access to the target, availability of adequate tools, and the ability to persist in the effort long enough to achieve eradication.

In the current sociopolitical environment in the U.S., the initiation and success of a rapid response can depend strongly on the extent of the infestation, ease of control, and the groups involved in the response. If the general requirements that are needed to initiate an eradication program are anticipated and preparations are made to meet those needs, the initiation of responses can avoid some of the confused and hesitant nature that sometimes characterize them at present. For example, in agriculture the responses to some pests, such as the Mediterranean fruit fly in general or the gypsy moth and hydrilla in California, are often aggressive and effective, though they are not without their opponents at times. In the realm of aquatic nuisance species, an excellent example of a beginning in this direction is the hydrilla prevention plan for Oregon entitled "Hydrilla Management in Oregon: Options, Obstacles, and Required Action" (Appendix 3). These are well recognized pests with a history of responses to them, so more information is available for them. In the introduction of a more novel pest, each situation is likely to be unique, with a large variety of unknowns, no perfect options, and difficult choices that need to be made.

UNDERTAKING A RAPID RESPONSE

A rapid response program is a variation of an integrated pest management program. The major difference between rapid response and pest management is that the goal of rapid response is to reduce the population to zero (eradication), where the goal in pest management is to maintain the population below an economic threshold (the point where potential damage outweighs the cost of control). Also, an eradication program is based upon an intentional trade-off of short-term, localized impacts for long-term, wide-area benefits, so an eradication effort may require accepting higher levels of non-target damage than a pest management program. Eradication programs become less desirable as they require more widespread treatment and cause longer term damage.

The elements of a basic rapid response are relatively straightforward. It is the sociopolitical and environmental issues in a response that can complicate the situation. In a basic response to a known threat the usual steps are: rapid confirmation of the identity of a suspicious organism; survey (delimitation) to determine the extent of the infestation; quarantine of the infested area if possible; a very quick review of the available control options to choose the one best suited for the treatment conditions; application of the chosen control options, with at least a visual evaluation of the results on the target and non-target species; modification of the control strategy as indicated by the results (sometimes called "adaptive management"). For a less well-known pest, there would be additional steps. Once the pest was identified, a rapid literature survey of the biology and control of the organism might be needed, as well as quick tests of the potential control options to identify the most promising ones. The first applications of the chosen options might be made on a limited basis, with at least a visual evaluation of the results on the target and

non-target species, to check that the treatment works as expected. The treatment might be modified as indicated by the results of the early applications or experiments and then general application would begin, with continued evaluation and modification as before. Some of these steps can be progressing at the same time.

Eradication efforts run the gamut from destroying a handful of individuals in one small spot to applying controls over large areas against millions of organisms. As the size of the population and area increase, complexity and cost increase rapidly, and the chance of success falls. Because of the rapid increase in impacts and complexity, it is overwhelmingly important to catch an invasion when it is small and can be treated more or less as a part of normal maintenance operations on a property. Large responses invite multiple agendas and all the difficulties that often attend them. The best situation is where a land manager recognizes a potential problem early on and either takes care of it personally or enlists the advice and aid of the single agency that has the greatest interest in seeing the pest eradicated. This situation is common for terrestrial weeds in cases where a local biologist or manager is aware of a potential threat. Unfortunately, it is much less likely in the realm of aquatic nuisance species because of the mobility of the species, their cryptic natures, the open nature of many water bodies, and the extreme value and sensitivity of water habitats.

In almost all situations involving aquatic nuisance species, the circumstances of the response will probably be complex. In a complex situation, the ELEMENTS OF A RESPONSE that need to be considered include:

1. Authority, leadership, and organization (that is, who has the legal ability to act, as well as who has the operational capability)
2. Coordination and cooperation among the different parties
3. Funding, resources
4. Quarantine establishment and enforcement
5. Environmental regulatory compliance: obtaining permits, developing documentation
6. Public awareness and education; outreach to affected property owners and parties
7. Delimitation survey (possibly also widespread detection survey) and mapping; evaluation of risk of spread
8. Review of knowledge on biology and controls; convening a science/management/environment advisory panel; research and technology transfer; identification of potential treatment methods
9. Implementation of eradication methods, including persistent survey and treatment to ensure eradication
10. Treatment assessment and adaptation. Accountability for progress towards eradication.
11. Environmental monitoring
12. Restoration / mitigation

As was shown by the *Salvinia* and *Caulerpa* examples, a response generally begins when a biologist or land manager, who is going about his/her other business, happens to notice something unusual and sends a sample to a university, museum, agriculture department, or other public agency to have it identified. Eventually, either the field or the lab person finds a responsive person in some agency. In a complex situation, a number of agencies and interested

parties come together and try to organize a response. Often it is a challenge to find an agency with clear authority, or, even better, the mandate and resources to respond to the introduction. As a result, the group tries to identify a lead agency and resources in an ad hoc, non-binding fashion. Either intentionally or not, they will also address some of the response elements listed above, often embodying the results in a consensus-based action plan.

OTHER RECENT EXAMPLES OF GENERAL RESPONSE PLANS

As this pattern holds quite frequently in responses to non-agricultural invasive species, there have been efforts to formalize this process. For instance in July, 2001, the national *Caulerpa taxifolia* conference (entitled "Implementing a National Prevention Program") proposed the following model for *Cualerpa*:

Discovery of new infestation

↓

Report/Notice to Agency

↓

Agency contacts others that should be notified (agencies with jurisdiction or regulatory authority, stakeholders, local experts)

↓

Convene Science Panel (5-7 members)

↓

Localized resource meeting/site visit and review (attended by Science Panel, Agency and appropriate others)

↓

Science Panel meeting to discuss problem and develop a statement of facts and anticipated direction

↓

Public meeting to do presentation on problem, Science Panel introduction and release of statement, and take public input/comment

↓

Science Panel issues report to Agency

They further stated that the Science Panel may be reconvened to do peer review of the eradication program or recommend new options as an implementation of Adaptive Management. The panel members should include experts on biology of the species in question, on the ecology of the habitat under invasion, on invasion ecology, and on eradication and management methods.

A model with a somewhat broader view came out of the National Giant Salvinia Conference in March, 2001:

I. Set up a standing incident command structure (ANS Council) with representatives from state and federal agencies, environmental organizations and universities. This body will be responsible for establishing a general response structure for their state in advance of an infestation and responding appropriately when a detection is reported [to] the lead entity.

General Response Structure:

Identify who will be notified of reports.

Identify who will do the identification of organisms.

Develop procedure to determine whether or not a rapid response will be undertaken.

II. Set up an Emergency Response Fund dedicated to supporting the activities deemed necessary by the ANS Council.

III. If a report is taken and the General Response Structure is followed and rapid response is necessary:

Organize Task Force: Include local parties interested/affected by infestation

Delimitation Survey: Extent, source, site ownership, resource needs, and regulatory needs.

IV. Use all information to evaluate options – convene a Science/Management Panel

V. Develop Action Plan

Pertinent Topics: Treatment Plan; Media Plan; Outreach/Education Plan; Research Needs; Intercepting Pathways; Monitoring Plan; Regulatory Compliance

VI. Obtain resources needed to implement Plan.

VII. Implement Action Plan

VIII. Monitor Effectiveness and Impacts of Treatments

IX. Modify Approach if indicated by monitoring program

The *Salvinia* model anticipates many of the problems identified in this document and addressed by the model system. Many other recent documents on pest prevention routinely identify the same sets of concerns about exclusion and rapid response capabilities as they currently stand. Clearly, except for some agricultural pests or other pests of long-standing importance, pest prevention currently has a number of weaknesses. These weaknesses begin with exclusion, which is outside of the scope of this plan. Beyond exclusion, the problems begin with detection capabilities, which are extremely important to success in rapid response. In rapid response itself, the problems center around a lack of clear authority, funding, resolution of environmental issues, and planning. These are problems that have been recognized at the national level and they have been identified as issues in the "National Invasive Species Management Plan" released by the National Invasive Species Council in November, 2000. The Council is a Cabinet-level group created by President Clinton's Executive Order of February 3, 1999.

THE MODEL SYSTEM

The model system proposed here attempts to address the weaknesses that have been identified in current rapid response efforts. It uses a two-level approach, both organized within the state government. The first level works on a state-wide basis to address authority, policy, funding, and priorities. The second level addresses the details of implementing specific projects, particularly the need for experienced supervision. Either embodied in this structure or through a separate fund, adequate resources for responses also need to be available on short notice, because new introductions are unpredictable. The goal of this approach is to create a system where, for a given introduction, the question of whether to eradicate is decided at the outset or even prior to introduction and, if the decision is to eradicate, then all aspects of the eradication are provided for. The system should address the response elements listed above (page 21), which currently

are typically addressed in an ad hoc action plan developed by a volunteer group as the response unfolds.

In the model system, a state creates a state-wide Aquatic Nuisance Species (or Invasive Species) Board through legislation. The members of the state Board should come from the departments that might have a concern in a rapid response. They should be high-level executives in order that the results of their deliberations will carry weight down to the staff level. The Board should include representatives of the major departments responsible for the resources that are threatened by invasive species or that may have responsibility to weigh the effects of control actions. Such departments should include those responsible for agriculture, fish, game, water, or other biological resources, as well as the departments responsible for pesticide regulation and other potential impacts, such as channel modification. The counterparts of these state representatives in the regional Federal government might also be on the Board because Federal issues and funds are often involved in a response. Finally, some members of the public should be on the Board, representing landholders, affected industries such as aquaculture and water conveyance, and environmental concerns. The goal is to create a Board that will consider the ramifications of a response and whose decisions will represent a broadly supported determination of the best option.

This Board identifies priority species, outlines general response goals for each species, provides authority for actions, and broadly addresses the means to resolve environmental issues that may arise during a response. In the list of response elements (page 21), the Board should address authorization, organization, collaboration, and funding (Response Elements 1, 2, and 3), the general aspects of quarantine, environmental compliance and documentation, and public awareness and outreach (Response Elements 4, 5, 6), and possibly the general aspects of environmental monitoring and restoration (Response Elements 11, 12). Most of the work should be done at the staff level and most situations and issues may be resolved there as well, but the Board should approve major policy and funding issues on a regular basis, and they should be available for deliberating on and deciding difficult or controversial situations. In a difficult situation, the Board might act as an "ecological court", considering arguments for and against eradication or other management options, while assuring all laws are addressed.

At the level where projects are implemented, either a single state department could be identified as the operational leader for all responses, or different situations or taxa could be assigned to different agencies. Only a very few agencies should have operational capacity, however, to avoid confusion and ambiguities. Ultimately, on any given eradication project, only one agency should have final responsibility and authority. The operations Department could either develop treatment expertise in its own structure and carry out control operations itself or it could develop a network of contractors to carry out work under its direction, as long as the Department has experienced biologists to check the results on the ground and make any necessary modifications to control strategies. The operations Department would have responsibility for developing the details of the response to any particular infestation and planning for new introductions, subject to the guidance of the state Board. The operations Department would address delimitation survey, development of treatment methods, implementation of eradication methods, and treatment assessment and adaptation (Response Elements 7, 8, 9, and 10). They would also address the technical aspects of resources needed for the response, quarantine, and public outreach and

awareness and education (Response Elements 3, 4, and 6) that are specific to the situation. The operations Department may also address the technical aspects of environmental compliance, environmental monitoring, and restoration (Response Elements 5, 11, and 12), or they may require assistance from other departments that specialize in these fields.

South Carolina provides one model of a coherent system to manage aquatic nuisance plants, a model that could serve for invasive species in general. The South Carolina Legislature established three interlocking entities in their system: an Aquatic Plant Management Council, the Aquatic Plant Management Program, and the Aquatic Plant Management Trust Fund. The Aquatic Plant Management Council is composed of representatives from state agencies with water resource management responsibilities, Clemson University, and the Governor's Office. The Council is chaired by the Water Resources Division of the Department of Natural Resources. The Council provides interagency coordination and serves as the principal advisory body to the Department of Natural Resources on all aspects of aquatic plant management and research in South Carolina. The Council establishes management policies, approves all management plans, and advises the Department on research priorities.

The Water Resources Division of the Department of Natural Resources runs the Aquatic Plant Management Program. The Department is responsible for developing an Aquatic Plant Management Plan that outlines the procedures for problem identification and analysis, selection of control methods, program development, and implementation of operations. The Plan also identifies problem areas, prescribes management practices, and sets management priorities.

The Aquatic Plant Management Trust Fund receives and expends funds for the prevention, management, and research of aquatic plant problems. The Fund may receive State appropriations, federal and local government funds, and funds from private sources. The SC Water Resources Division of the Department of Natural Resources administers the Fund, which is kept separate from other State funds.

Oregon has recently passed a law that may lead to a similar system. It creates a council centered around the Directors of the Departments of Agriculture and Fish and Wildlife, the president of Portland State University, and the head of the Sea Grant College of Oregon State University. These four members appoint another eight members from local and federal government, as well as industry and public representatives. The council's job is to increase public awareness about invasive species by developing Internet sites and educational materials. It is also charged with developing an invasive species management plan. Their first task in preparing the plan is to review state authority needed to exclude and eradicate invasive species. The council may also direct work on invasive species projects by providing grants. The law also creates a fund that acts as a permanent account to hold funds over from one budget year to the next, so they are not lost back to the state's general fund. The law does not identify a Department to carry out eradication operations, identify a mechanism to resolve environmental and other issues, or explicitly address many of the elements that are important to a successful rapid response program, and it does not appropriate many resources. However, these gaps may be filled if the council forcefully represents the requirements of successful rapid response programs and clearly identifies the deficiencies of current laws and authorities.

NATIONAL INITIATIVES

In addition to setting up a state-wide system for addressing rapid response, relatively modest efforts at the national level could help tremendously. The most cost-effective would be developing reviews of biology and control methods for various high priority species or higher taxonomic groups to be used as the basis for control projects. Many of these species are of concern for many different parts of the country and the general pest biology and the range of control options are usually very similar from place to place. It makes little sense for each state to have to develop this information for itself. Many authorities have repeatedly noted the importance of ready access to technical information in the success of an eradication effort.

SUMMARY

A rapid response can occur in a complicated social and environmental setting, but in most instances a response must be initiated quickly and forcefully if there is to be a hope of eradication. Although debate and consensus-building are desirable means to construct public policy, if they slow the initiation of a response they are counterproductive to the goal of eradication. One goal of this plan is to create a system where this debate and consensus-building largely occur before an introduction of an invasive species, at least on a general basis. Once an introduction occurs, the same system should provide a forum where remaining issues may be resolved rapidly and a decision made to proceed with eradication, or with some other management action, or to allow the invasion to take its course. If the decision is made to eradicate, the final goal of this plan is to put competent pest management personnel on the ground and give them the freedom to focus on the infestation with the persistence that is required to achieve eradication.

The approach to these goals employs a two-level organization. The first level, the state council, focuses on the debate and on preparing the way for vigorous response efforts. This level must occur at a high level of state management and with participation of affected federal and local interests. Its decisions on a course of action should provide the state authority to achieve those goals. The second level of organization focuses on the operations on the ground. It also identifies the various issues and options surrounding invasive species and informs the first level about them, and further uses that information to prepare for introductions. Once the first level outlines a course of action, the second level focuses its knowledge and experience on the field operations needed to achieve the goals.

A successful response to an invasive species requires access to adequate tools, access to the target species, and, often, dogged persistence. Sometimes these requirements are not convenient or inexpensive for society, and extra costs fall on the people and habitats caught up in the area of infestation. The decision to eradicate or otherwise respond to an invasive species can be difficult, and it needs to have a forum that reflects the importance of the issues involved. Once the decision is made to eradicate or suppress an introduced population, however, the managers on the ground need to put their full energies on finding and removing the target species. This plan attempts to address these dual needs and maximize success against invasive aquatic nuisance species.

APPENDIX J

PROPOSED INVASIVE SPECIES COUNCIL LEGISLATION

(patterned after the Oregon legislation below)

Montana Proposed Legislation – in review

This legislation creates an Invasive Species Council (ISC) to coordinate and foster cooperation between existing programs dealing with invasive species, and help fill the gaps between programs. The council consists of 12 members and will: appoint a State Invasive Species Coordinator, establish advisory and technical committees, create and maintain means of communicating sightings of invasive species, produce educational materials, solicit proposals and review applications for grants to further projects providing education about invasive species, and provide grants or loans for the eradication of new invasions. The ISC addresses terrestrial and aquatic species.

The following is the Oregon Legislation that will be used to draft Montana's legislation:

Relating to pests; creating new provisions; amending ORS 634.665; repealing ORS 634.670; and appropriating money.
Be It Enacted by the People of the State of Oregon:

SECTION 1. { + (1) There is established the **Invasive Species Council**. Except as provided in section 4 (1) of this 2001 Act, the council shall consist of 12 members. The following persons are ex officio members of the council:
(a) The Director of Agriculture or a designated representative.
(b) The president of Portland State University or a designated representative.
(c) The State Fish and Wildlife Director or a designated representative.
(d) The administrative head of the Sea Grant College of Oregon State University or a designated representative.
(2) Each of the ex officio members described in subsection (1) of this section shall appoint two members to the council.
(3) The term of office of each appointed member is two years, but an appointed member serves at the pleasure of the appointing authority. Before the expiration of a term, the appointing authority shall appoint a successor whose term begins on January 1 next following. An appointed member may not serve more than two successive terms on the council. If there is a vacancy in an appointed member position for any cause, the appointing authority shall make an appointment to become immediately effective for the unexpired term.
(4) In making appointments to the council, the appointing authorities shall endeavor to appoint persons representative of the geographic, cultural and economic diversity of this state. The appointing authorities may give consideration to nominations submitted by federal and state

agencies, local governments, universities, industry and other groups having an interest in invasive species.

(5) An appointed member of the council is not entitled to compensation under ORS 292.495. A member of the council is not entitled to reimbursement for expenses. At the discretion of the council, council members may be reimbursed from funds available to the council for actual and necessary travel and other expenses incurred by members of the council in the performance of their official duties, subject to the limits described in ORS 292.495. + }

SECTION 2. { + Notwithstanding the term of office specified by section 1 of this 2001 Act, of the eight members first appointed to the Invasive Species Council:

(1) Four shall serve for terms ending January 1, 2003.

(2) Four shall serve for terms ending January 1, 2004. + }

SECTION 3. { + (1) The Invasive Species Council shall select a voting ex officio member of the council as chairperson and another voting ex officio member as vice chairperson. Each voting ex officio member of the council shall serve one year as chairperson and one year as vice chairperson during any four-year period. The chairperson and vice chairperson shall have duties and powers necessary for the performance of the functions of those offices as a majority of the voting ex officio members determines.

(2) A majority of the voting members of the council constitutes a quorum for the transaction of business.

(3) The council shall meet at times and places specified by the call of the chairperson or of a majority of the voting members of the council. + }

SECTION 4. { + (1) Subject to available funding, the Invasive Species Council may appoint a State Invasive Species Coordinator to serve at the pleasure of the voting members of the council. The appointment of the coordinator must be by written order, filed with the Secretary of State. If the council appoints a coordinator, the coordinator shall serve as a nonvoting ex officio member of the council.

(2) The State Department of Agriculture is responsible for ensuring payment of the administrative expenses of the council. The State Department of Agriculture may enter into interagency agreements under ORS 190.110 with the State Department of Fish and Wildlife, Portland State University and Oregon State University for sharing the administrative expenses of the council. + }

SECTION 5. { + (1) The Invasive Species Council may establish advisory and technical committees that it considers necessary to aid and advise the council in the performance of its functions. The committees may be continuing or temporary committees. The council shall determine the representation, membership, terms and organization of the committees and appoint their members.

(2) Members of the committees are not entitled to compensation, but at the discretion of the council may be reimbursed from funds available to the council for actual and necessary travel and other expenses incurred by members of the committees in the performance of their official duties, subject to ORS 292.495. + }

SECTION 6. { + (1) As used in this section, 'invasive species ' means nonnative organisms that cause economic or environmental harm and are capable of spreading to new areas of the state. ' Invasive species' does not include humans, domestic livestock or nonharmful exotic organisms.

(2) The Invasive Species Council shall:

(a) Create and maintain appropriate Internet sites, toll-free telephone numbers or other means of communication for statewide use in reporting sightings of invasive species.

(b) Encourage the reporting of invasive species sightings by publicizing means of communication made available by the council under paragraph (a) of this subsection.

(c) Forward reports of invasive species sightings to appropriate agencies.

(d) Produce educational materials and press releases concerning invasive species.

(e) Conduct educational meetings and conferences.

(f) Develop a statewide plan for dealing with invasive species. The plan should include, but need not be limited to, a review of state authority to prevent the introduction of invasive species and to eradicate, contain or manage existing invasive species.

(g) Solicit proposals and review applications for grants or loans to further projects providing education about invasive species.

(h) Provide grants or loans to agencies, organizations or individuals for eradicating new invasions.

(3) The council may approve the expenditure of funds by the council, or any member thereof, for the production of educational materials or the presentation of educational materials. + }

SECTION 7. { + (1) The Invasive Species Council Account is established in the General Fund of the State Treasury. Except as provided under subsection (2) of this section, all moneys received by the Invasive Species Council shall be paid into the
State Treasury and credited to the account. All moneys in the account are continuously appropriated to the council and may be used by the council for purposes authorized by law, including but not limited to providing grants or loans as described under section 6 of this 2001 Act.

(2) The Invasive Species Council may accept moneys through gifts, grants and donations from public and private sources. The council shall deposit the gifts, grants and donations with the State Treasurer for credit to a trust account separate and distinct from the General Fund. Interest earned by the trust account shall be credited to the trust account. Except as otherwise provided by the donor, the council may use trust account moneys for any purpose described in section 6 of this 2001 Act. + }

SECTION 8. { + The Interagency Integrated Pest Management Coordinating Committee is abolished. On the effective date of this 2001 Act, the tenure of the members of the Interagency Integrated Pest Management Coordinating Committee shall cease. + }

SECTION 9. { + (1) This 2001 Act does not relieve a person of any obligation with respect to a fee or other charge or other liability, duty or obligation owing to the Interagency Integrated Pest Management Coordinating Committee. The Invasive Species
Council may undertake the collection or enforcement of any such fee, charge or other liability, duty or obligation.

(2) The rights and obligations of the committee legally incurred under contracts, leases and business transactions executed, entered into or begun before the effective date of this

2001 Act are transferred to the council. For the purpose of succession to these rights and obligations, the council is considered to be a continuation of the committee and not a new authority, and the council shall exercise such rights and fulfill such obligations as if they had not been transferred. + }

SECTION 10. { + There are transferred to the Invasive Species Council:
(1) All the supplies, materials, equipment, records, books, papers and facilities of the Interagency Integrated Pest Management Coordinating Committee.
(2) In addition to and not in lieu of any other appropriation, the unexpended balances of any appropriations or other amounts authorized to be expended by the Interagency Integrated Pest Management Coordinating Committee for the purposes of any duties, functions or powers of the committee are appropriated and transferred to the State Department of Agriculture for expenditure on behalf of the Invasive Species Council. The expenditure classifications, if any, established by Acts authorizing or limiting expenditures by the committee remain applicable to expenditures by the department under this subsection. + }

SECTION 11. ORS 634.665 is amended to read:
634.665. (1) Each state agency or institution listed under ORS 634.660 shall provide integrated pest management training for employees responsible for pest management. {- The training programs shall be developed in cooperation with the Interagency Integrated Pest Management Coordinating Committee created under ORS 634.670. - }
(2) Each state agency or institution listed under ORS 634.660 shall designate an integrated pest management coordinator. The integrated pest management coordinator shall { - : - }
{ - (a) - } manage the integrated pest management program of the agency or institution { + . +} { - ; and - }
{ - (b) Report at least annually to the Interagency Integrated Pest Management Coordinating Committee about the implementation of the agency or institution program. The report shall: - }
{ - (A) Identify current pest management practices; - }
{ - (B) Evaluate the effectiveness of current programs, including integrated pest management programs; and - }
{ - (C) Identify areas where integrated pest management is scheduled to be implemented during the ensuing year. - }

SECTION 12. { + ORS 634.670 is repealed. + }

SECTION 13. { + Notwithstanding section 3 of this 2001 Act, for purposes of sections 9 and 10 of this 2001 Act, the Director of Agriculture or a designee shall act as temporary chairperson of the Invasive Species Council and exercise council authority until the selection of a chairperson under section 3 of this 2001 Act. + }